FAO Fisheries Synopsis No. 125, Volume 13 FIR/S125 Vol. 13

FAO SPECIES CATALOGUE

VOL. 13 MARINE LOBSTERS OF THE WORLD

An Annotated and Illustrated Catalogue of Species of Interest to Fisheries Known to Date

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

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An Annotated and Illustrated Catalogue
of Species of Interest to Fisheries Known to date

prepared by

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Cover illustration: the Atlantic deep-sea lobster (***Acantacharis caeca***) in aggressive posture outside its burrow. Drawing by M. D'Antoni.

PREPARATION OF THIS DOCUMENT

Lobsters are among the most prized of fisheries resources and of significant commercial interest in many countries. Because of their high value and esteemed culinary worth, much attention has been paid to lobsters in biological, fisheries, and systematic literature. The present volume represents a comprehensive treatment of the identification, taxonomy, distribution, biology and ecology of the world's lobsters that are of interest to fisheries.

The author of this catalogue, Dr L.B. Holthuis, is one of the world's foremost authorities on crustaceans. He prepared the first volume in the FAO species catalogue series, "Shrimps and Prawns of the World" published in 1980. He also has collaborated with FAO in the preparation of crustacean species identification sheets for the eastern central Atlantic, the western Indian Ocean, and the Mediterranean/Black Seas, and by revising the information on crustaceans for most of FAO's national field guides to commercial marine resources in Africa and Asia. One of his areas of specialization is lobsters and since 1946 he has been the sole or senior author for over 25 taxonomic articles concerning this group; more than any other author, past or present. His work on lobsters has included the examination of specimens from the major museums of the world and extensive travels to examine and collect them firsthand.

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ABSTRACT

This is the thirteenth issue in the FAO series of world-wide annotated and illustrated catalogues of major groups of organisms that enter marine fisheries. The present volume on marine lobsters includes 149 species in 3 infraorders, 10 families and 33 genera. There is an introductory section that supplies general remarks on the biology and fisheries of lobsters, a glossary of technical terms, illustrated keys to infraorders, superfamilies, families, subfamilies and species, and detailed accounts on species. Species accounts include illustrations of the species and their distributions, and information on scientific and vernacular names, types, distribution, habitat, biology, size, interest to fisheries, and relevant literature. Following the species accounts is a table of species by major fishing area, an index, and a bibliography. Two original contributions to nomenclature are presented in this volume. A new subgenus, ***Sagmariasus***, is erected under the palinurid genus ***Jasus***. In addition, the new name, ***Callianassa biffari***, is proposed to replace the junior primary homonym ***C. affinis*** Holmes, 1900.

Distribution

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and Commissions
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1. INTRODUCTION

This catalogue intends to include all those species of marine lobsters that are of interest to fisheries, according to the following three criteria: (i) all species known to be used for food, (ii) species known to be sold for bait and as subproducts, (iii) species not exploited at present but considered by experts to be of potential commercial value. The last category includes deep-sea forms which during exploratory fishing cruises were found to be sufficiently abundant, large enough in size, and sufficiently accessible to fishing gear so that a fishery for them might be profitable. Edible species found in markets as an admixture to the main catch are included, even if they only make up a negligible percentage of the catch.

The classification adopted here is a traditional one. The marine lobsters are considered to form part of the suborder Macrura Reptantia Bouvier, 1917, which is recognized here as one of the four suborders of the order Decapoda Latreille, 1802. The Decapoda form one of the many orders of the Class Crustacea, Brünnich, 1772*. Aside from the Macrura Reptantia, there are the following three suborders in the Decapoda: Macrura Natantia (shrimps), Anomura (hermit crabs, etc.) and Brachyura (crabs). In several modern handbooks (e.g. Bowman & Abele, 1982, in Bliss, Biology of Crustacea, 1:21-25) the Decapoda are divided into two suborders, the Dendrobranchiata (containing the Penaeidea) and the Pleocyemata (containing all the other Decapoda). The suborder Macrura Reptantia is discarded in this modern classification, but the infraorders Astacidea, Palinuridea and Thalassinidea are kept as such; the former suborders Anomura and Brachyura are demoted to infraorders and are on the same level as the Astacidea, Palinuridea and Thalassinidea. The closer link between these last 3 infraorders as indicated in the traditional classification is ignored in the modern classification. From the infraorders down, the classification of the Macrura Reptantia is the same in the two systems.

The present catalogue is largely based on data obtained from the literature and often it is difficult to evaluate the reliability of published data. Sometimes authors working far from adequate library facilities have difficulty in correctly identifying the species they encounter in the field. Moreover, the discovery of new species, the more correct delimitation of known species, or even the introduction of nomenclatural changes, may cause confusion and lead to the use of scientific names that are incorrect by modern standards, or apply to more than one species. For instance, recent taxonomic investigations showed that the name ***Panulirus japonicus*** had long been used for specimens which now prove to belong to five distinct species (***P. japonicus, P. marginatus, P. pascuensis, P. cygnus*** and ***P. longipes***), and the subspecies ***P. longipes femoristriga***. Some authors used the name ***longipes*** for what is now recognized as ***P. cygnus*** and ***P. longipes***, considering them distinct from ***P. japonicus***. Therefore old records of ***P. japonicus*** and ***P. longipes*** have to be treated with some reserve, although several of these species have a quite restricted distribution, and their provenance may give a clue to their true identity. A similar situation involves the species of the subgenus ***Jasus (Jasus)***, which in the older literature were considered to be a single species, or at the most two, but which now are recognized as six distinct species (***J. lalandii, J. frontalis, J. edwardsii, J. paulensis, J. tristani, and J. novaehollandiae***). Quite recently all but one of the species of ***Nephrops*** were transferred to the genus ***Metanephrops***, with the result that the names of those species had to be changed accordingly. All such name changes, due to changing taxonomic views, are unavoidable and will also occur in the future. Name changes due to purely nomenclatural reasons have become quite rare in Macrura Reptantia.

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* It proved not very easy to establish who has to be cited as the author of the name Crustacea. This name actually dates from the earliest published books dealing with these animals. Belon (1553, De aquatilibus Libri duo: 343) used the name Crustata for lobsters, shrimps and crabs. One year later G. Rondelet (1554, Libri de Piscibus Marinis: 534) used the actual spelling Crustacea for the group ("De Piscibus Liber XVIII. Quae dicantur Crustacea"). Many subsequent authors adopted this name. However, Linnaeus (1758, Systema Naturae (ed. 10)1) ignored the term Crustacea and placed the crustaceous animals together with the spiders, millepeds, etc. in his "Insecta Aptera". The name Crustacea can be found in some early post-linnean non-binominal works like those by Roesel von Rosenhof (1755-1759, Monatliche Insektenbelustigungen, 3:305; and its 1764-1768 Dutch translation, De Natuurlijke Historie der Insecten, 3 (2):267), and the one by Brisson (1762, Regnum Animale in Classes IX:6). The first nomenclaturally available work to use the term Crustacea is, to my knowledge, that by Brünnich (1772, Zoologiae Fundamenta Praelectionibus Academicis Accomodata. Grunde i Dyrelaeren: 174, 184), who separated the Crustacea (in which he included Chelicerata and Crustacea in the modern sense) from the Insecta Aptera (in which he left true insects like ***Lepisma, Podura, Termes, Pediculus*** and ***Pulex***). Pennant (1777, British Zoology (ed.4)4) listed the groups dealt with in this fourth volume as "Crustacea.Mollusca.Testacea", and carried the term again on the title page preceding p. 1 of the text of Class V "Crustacea. Crustaceous Animals". In the same year also Scopoli in his 1777 book "Introductio ad Historiam Naturalem" on p. 404 used the term Crustacea namely for his Gens I of Tribus IV "Crustacea Brunnich".

The question whether the generic name of the common lobster should be ***Homarus*** or ***Astacus*** was a controversial topic in the end of last century, but has since been definitely decided. Some well known specific names have been changed for reasons of priority, e.g., ***Palinurus vulgaris*** Latreille, 1804, to ***Palinurus elephas*** (Fabricius, 1787), and ***Homarus vulgaris*** H. Milne Edwards, 1837, to ***Homarus gammarus*** (Linnaeus, 1758), but most of these problems have been straightened out long ago and no longer cause any difficulties.

In the nomenclature of the spiny lobsters, there is a curious source of considerable confusion. This is the similarity of the two generic names ***Palinurus*** Fabricius, 1798, and ***Panulirus*** White, 1847, for two closely related genera. White (1847), when splitting the genus ***Palinurus*** into three genera, chose two new taxa names that are anagrams of ***Palinurus***, viz., ***Panulirus*** and ***Linuparus***. ***Linuparus*** is sufficiently different from either of the other names that it caused no difficulties, but ***Panulirus*** and ***Palinurus*** were frequently confused. Pfeffer (1881) tried to solve the problem by replacing ***Panulirus*** by a new generic name ***Senex***, but this action is against the rules of nomenclature and ***Senex*** lapsed. ***Panulirus,*** being the valid name, has to be used, and at present it is generally accepted and has become firmly entrenched in carcinological nomenclature.

In taxonomic literature (with which I am best acquainted) information on the economic importance of species is rather scarce and of a very general nature. Relevant fisheries literature, being less familiar to me, was often difficult to locate. Notwithstanding the great help that I received in obtaining literature and information from Dr W. Fischer, FAO, Rome and from fishery authorities all over the world, I may have overlooked important sources.

ACKNOWLEDGEMENTS

Thanks are due to Dr Walter Fischer, Fishery Resources and Environment Division, FAO, Rome, for his enormous help with the composition of this catalogue. It was through his insistence that keys and illustrations were added, against my strong objections; the result shows how right he was. Ms M. D'Antoni and Mr P. Lastrico had the thankless task of supervising and producing the illustrative work, often an almost impossible undertaking when they had to work from published photographs in which details could hardly or not at all be discerned; it is due to their capability and patience that most of the figures came out so well. The outlay, editing and word processing of the catalogue was done by Dr Luca Garibaldi and Ms Giulia Sciarappa-Demuro and I am most indebted to their expertise and for their patience with me.

A serious attempt has been made in this catalogue to ascertain the location and condition of the type specimens of the species treated, including those of their synonyms. For this project I received the most valuable help from the following persons, whose names are followed by the abbreviations used for the names of their institutes (see p. 4): Dr Maya Deb (ZSI), Prof. Jacques Forest (MP), Dr D.J.G. Griffin (AMS), Dr H.-E. Gruner (ZMB), Dr J.M.C. Holmes (NMI), Dr R.W. Ingle (BM), Mme E. Lang (MZS), Dr E.A. Lazo-Wasem (YPM), Dr Raymond B. Manning (USNM), Mrs M.G. van der Merwe (SAM), Mr D. Platvoet (ZMA), Dr Earle E. Spamer (ANSP), Dr R.J. Symonds (ZMC), Dr Ludwig Tiefenbacher (ZSM), Dr Michael Türkay (SMF), Dr Torben Wolff (UZM), Dr John C. Yaldwyn (DWM); I am very grateful to all for giving so much of their time to find the required information.

From various persons I received information about lobsters, both oral and written, published and unpublished, which I have used in this catalogue. I am most grateful to all, and should like to mention especially Mr J.D. Booth, Fisheries Research Centre, Wellington, New Zealand (information on ***Jasus*** and ***Projasus***), Prof. Phaibul Naiyanetr, Chulalongkorn University, Bangkok, Thailand (occurrence, use and vernacular names of Thai lobsters), Mr T.J. Ward, CSIRO, Hobart, Tasmania, Australia (unpublished information on ***Linuparus***) and Dr Takao Yamaguchi, Aitsu Marine Biological Station, Kumamoto University, Japan (Japanese names of the Japanese lobsters).

1.1 Plan of the Catalogue

The presentation of each systematic category always includes the valid scientific name, reference to the original description, synonyms, and keys to, or lists of, the lower categories concerned. A brief diagnosis is given for Infraorders. The information by species is arranged under the following paragraphs:

(1) **Scientific Name** : The heading for each species gives the valid name followed by the reference to its original description.

(2) **Synonyms** : All known synonyms of the valid name are listed, as well as the new combinations made with the valid and synonymous specific names. In the new combinations, the scientific name and the name of the author who first used the combination are separated by a dash (-), while in the synonyms no such interpunction is present. Incorrect identifications of the species are not listed as a rule, but, in cases where the incorrect name has frequently been used for the species, it is briefly discussed.

(3) **FAO Names** : English, French and Spanish names for each species, to be used primarily within FAO, were selected on the basis of the following criteria: (i) each name must apply to one species only, in a worldwide context; (ii) the name must conform to FAO spelling nomenclature; (iii) the name should not lead to confusion with crustaceans other than lobsters; e.g., the word langostino is not used for Spanish FAO names, although in some Spanish speaking countries it is employed for some lobster species; the reason for this is that in Spain and Venezuela the word langostino is used for some species of shrimp. Wherever possible, the denominations selected were based on vernacular names (or parts of names) already in existence within the areas where the species is fished. FAO names are of course not intended to replace local species names, but they are considered by FAO necessary to overcome the considerable confusion caused by the use of a single name for many different species, or several names for one species.

In some cases previous FAO names have been changed in this catalogue. In most instances this was done to obtain more consistency at the generic level. In the present catalogue, all species of one genus have the same name provided with an appropriate prefix for each: e.g., all species of the genus ***Jasus*** are named "rock lobster", ***Jasus edwardsii*** having the name red rock lobster. These "generic" FAO names as used in this catalogue are the following (in systematic sequence): pincer lobster (the genera of Thaumastochelidae: ***Thaumastocheles*** and ***Thaumastochelopsis***), deep-sea lobster (***Acanthacaris***), lobsterette (all genera of Thymopinae: ***Nephropides***, ***Nephropsis***, ***Thymops***, ***Thymopsis***), lobster (all genera of Nephropinae: ***Eunephrops***, ***Homarus***, ***Metanephrops***, ***Nephrops***, ***Thymopides***), fenix lobster (***Neoglyphea***), rock lobster (***Jasus***), furrow lobster (***Justitia***), spear lobster (***Linuparus***), spiny lobster (***Palinurus*** and ***Panulirus***), blunthorn lobster (***Palinustus***), jagged lobster (***Projasus***), whip lobster (***Puerulus***), furry lobster (the genera of Synaxidae: ***Palibythus*** and ***Palinurellus***), Spanish lobster (***Arctides***), slipper lobster (***Scyllarides***), fan lobster (***Evibacus*** and ***Ibacus***), mitten lobster (***Parribacus***), locust lobster (***Scyllarus***), flat lobster (***Thenus***), mud lobster (***Thalassina***), mud shrimp (***Upogebia***), ghost shrimp (***Callianassa***).

(4) **Type** : The type locality of the species (and of its synonyms) is provided. As a rule the indication of the type locality as given in the original publication is verbally quoted; if necessary, to this quotation explanatory or corrective details are added. The depository of the primary types is listed; if possible the present depository is given, but if that is unknown the depository at the time of the original description is indicated.

(5) **Diagnostic Features** : This topic is omitted for almost all the species presented in this catalogue because the key is considered sufficient for identification. For species of the genus ***Scyllarus***, ***Thalassina***, ***Upogebia***, and ***Callianassa*** however, where no key is included, diagnostic features are included to aid in identification.

(6) **Geographical Distribution** : The entire known geographic range of the species is given, including areas where it is not of commercial importance. Of each species, the known range is illustrated on a map. These maps are only meant to give a general impression of the distribution of the species.

(7) **Habitat and Biology** : The known depth range of the species, and information on types of substrate and salinity of its habitat are given here. In most instances this information is rather incomplete. Also, if available, the most important data on the biology of this species are mentioned.

(8) **Size** : The known total length (tl.), as well as the known carapace length (cl.) of both males and females, are provided where possible. Total length is measured from the tip of the rostrum to the extremity of the telson, but due to the curvature of the body this measurement usually is not very accurate. The carapace length generally includes the rostrum, but very often the actual extent of this length (whether measured from the tip of the rostrum, or from the posterior margin of the orbit to the posterior margin of the carapace) is not indicated in the literature. Where total and carapace lengths are both given, the respective figures do not necessarily pertain to the same specimens but may have been obtained from different sources. As often the available information on the size attained by some species is very meagre, the figure cited here may be well below the actual maximum size, or may be a size rarely attained.

(9) **Interest to Fisheries** : This paragraph gives an account of the areas where the species is fished and of the nature of the fishery; its importance is either estimated (minor, moderate, major, or potential) or actual figures of annual landings are provided. Data on utilization (fresh, dried, cooked, frozen, canned, etc.) are also given where available. Here too, the quality and quantity of the available information vary considerably with the species.

(10) **Local Names** : These are the names used locally for the various species. The local species denomination is preceded by the name of the country concerned (in capital letters), and, where necessary, followed (in parentheses)by the geographical specification or by the language of the transcribed vernacular names. When known, the most commonly used vernacular name is listed first after each country, otherwise the names are in alphabetical order. The catalogue was compiled from many sources, but where vernacular names are concerned it doubtlessly is incomplete. Where a large number of local names are used for one species in a restricted area, only the most common are included.

(11) **Literature** : Reference is made to those papers giving good descriptions and illustrations of the species or treating it extensively (e.g., Species Synopses published by FAO and CSIRO, FAO Species Identification Sheets, etc.), or giving a helpful account of it.

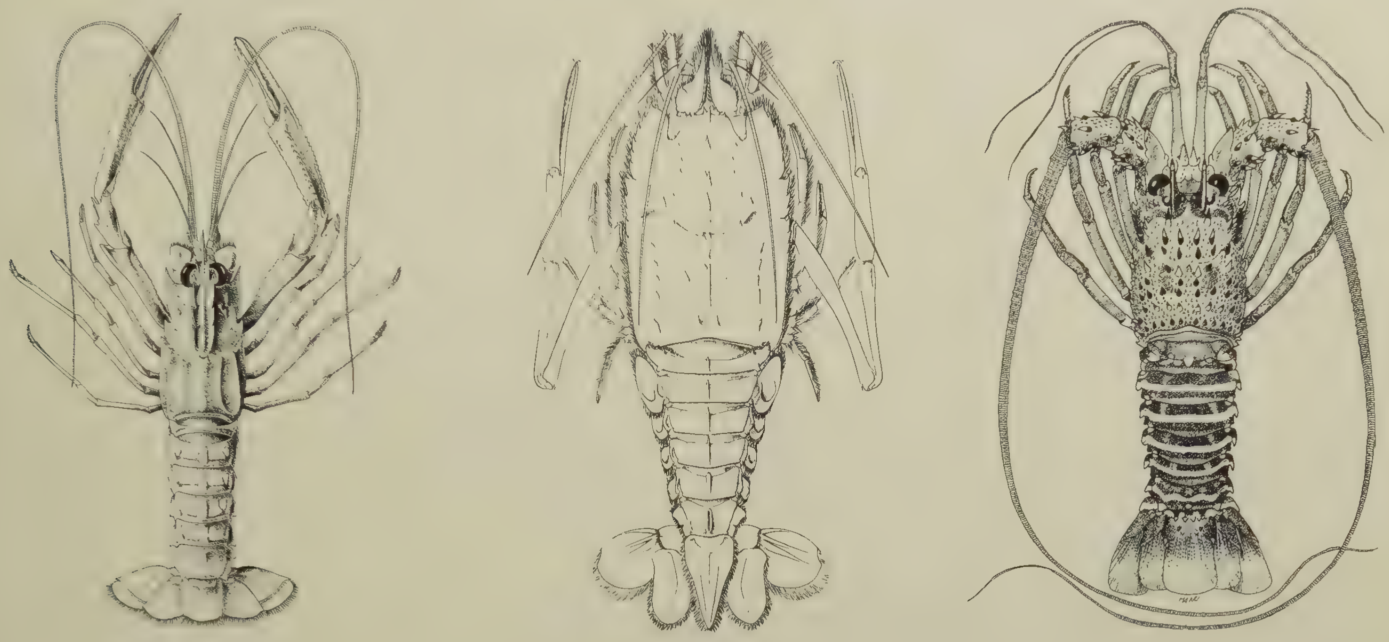
(12) **Remarks** : Important information concerning the species and not fitting in any of the previous paragraphs is given here.

Abbreviations used : The following abbreviations are used to indicate the depositories of type material: **AMS**: The Australian Museum, Sydney, Australia. **ANSP**: The Academy of Natural Sciences of Philadelphia, Philadelphia, Pennsylvania, USA. **BM**: British Museum (Natural History) (now: The Natural History Museum), London, England, UK. **DMW**: Dominion Museum (now: National Museum), Wellington, New Zealand. **MCZ**: Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA. **MNRJ**: Museu Nacional, Rio de Janeiro, Brazil. **MOM**: Institut Océanographique, Monaco. **MP**: Muséum National d'Histoire Naturelle, Paris, France. **MT**: Det Kongelige Norske Videnskabers Selskabs Museum, Trondheim, Norway. **MZS**: Musée Zoologique de l'Université, Strasbourg, France. **MZT**: Museo ed Istituto di Zoologia Sistematica dell'Universitá di Torino, Italy. **NMI**: National Museum of Ireland, Natural History Division, Dublin, Ireland. **NMW**: Naturhistorisches Museum (formerly K.u.K. Naturhistorisches Hofmuseum), Wien, Austria. **NTOU**: National Taiwan Ocean University, Keelung, Taiwan **QM**: Queensland Museum, South Brisbane, Qld, Australia. **RMNH**: Rijksmuseum van Natuurlijke Historie (now: Nationaal Natuurhistorisch Museum), Leiden, The Netherlands. **SAM**: South African Museum, Capetown, South Africa. **SMF**: Natur-Museum Senckenberg, Frankfurt, Germany. **TFRI**: Taiwan Fisheries Research Institute, Keelung, Taiwan. **UMML**: University of Miami Marine Laboratory (now: Institute of Marine and Atmospheric Science, University of Miami), Miami, Florida, USA. **USNM**: United States National Museum (now: National Museum of Natural History), Smithsonian Institution, Washington, DC, USA. **UZM**: Universitetets Zoologiske Museum, Copenhagen, Denmark. **WAM**: Western Australian Museum, Perth, Western Australia, Australia. **YPM**: Peabody Museum of Natural History, Yale University, New Haven, Connecticut, USA. **ZMA**: Zoologisch Museum, Universiteit van Amsterdam, Amsterdam, The Netherlands. **ZMB**: Zoologisches Museum der Humboldt-Universität, Berlin, Germany. **ZMC**: University Museum of Zoology, Cambridge, England, UK. **ZMH**: Zoologisches Museum und Institut, Hamburg, Germany. **ZML**: Zoologisches Museum, Lübeck, Germany. **ZMUG**: Zoologisches Museum der Universität, Göttingen, Germany, at present on permanent loan to Natur-Museum Senckenberg, Frankfurt am Main, Germany. **ZSI**: Zoological Survey of India, Calcutta, India. **ZSM**: Zoologische Staatssammlung, München, Bavaria, Germany.

1.2 General Remarks on Lobsters

1.2.1 Morphology

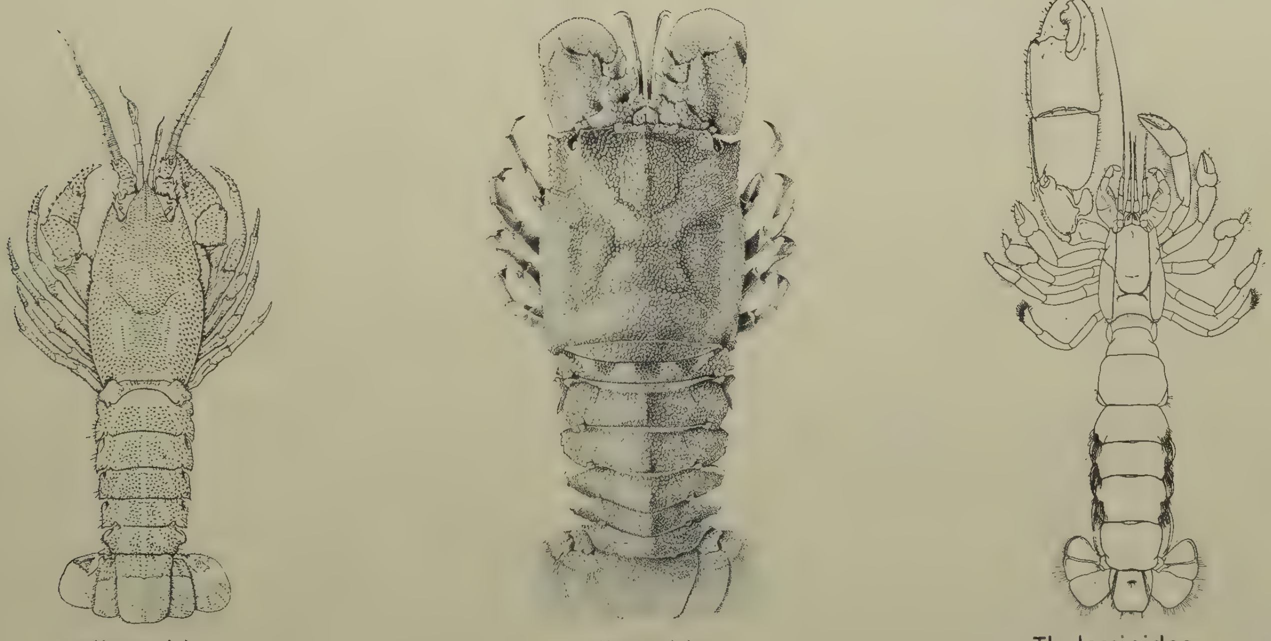
Even though the various major groups of lobsters show obvious differences in general appearance (see Fig. 1), their basic morphology is essentially the same.



Nephropoidea
Nephropidae
Metanephrops andamanicus

Eryonoidea
Polychelidae
Stereomastis sculpta

Palinuroidea
Palinuridae
Panulirus marginatus



Palinuroidea
Synaxidae
Palinurellus wieneckii

Palinuroidea
Scyllaridae
Scyllarides herklotsii

Thalassinidea
Callianassidae
Callianassa japonica

Fig. 1. Major types of lobsters, showing differences in shape

The body of a lobster consists of two recognizable parts: the cephalothorax (= the entity formed by the fusion of cephalon, or head, with the thorax) with its appendages, and the abdomen (= tail) with its appendages (Fig. 2).

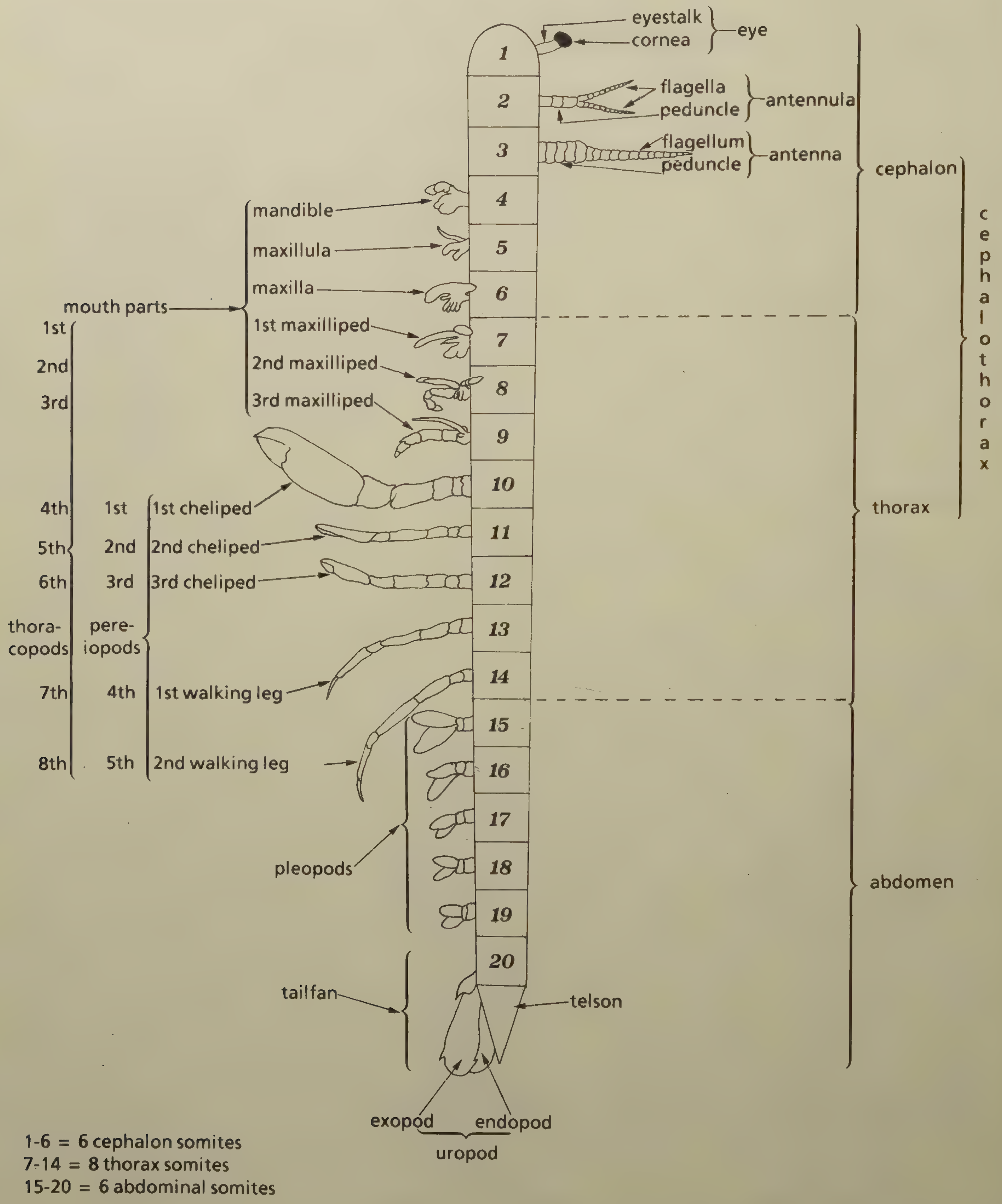

eyestalk
cornea
eye
flagella
peduncle
antennula
flagellum
peduncle
antenna
cephalon
cephalothorax
thorax
abdomen
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
mandible
maxillula
maxilla
mouth parts
1st maxilliped
2nd maxilliped
3rd maxilliped
1st
2nd
3rd
4th
5th
6th
7th
8th
thora-copods
1st
2nd
3rd
4th
5th
pere-iopods
1st cheliped
2nd cheliped
3rd cheliped
1st walking leg
2nd walking leg
pleopods
tailfan
telson
exopod
endopod
uropod
1-6 = 6 cephalon somites
7-14 = 8 thorax somites
15-20 = 6 abdominal somites

Fig. 2 Schematic illustration of the body and appendages of a lobster (Nephropoidea)

The 14 somites (or body-segments) of the cephalothorax (the first 6 forming the cephalon, the last 8 the thorax) are fused and only in a few places there are visible indications of the lines between the somites. Each somite carries one pair of appendages. These appendages are the following: Somite 1 (= ophthalmic somite) carries the eyes, that are usually movable and consist of a stalk, formed by one or two segments, the distal of which carries the pigmented cornea with visual elements; the eyes sometimes are reduced, viz., the cornea may lack pigment or visual elements; such a reduced functionless eye may even be immovably fused with the body or be altogether absent. Somite 2 (= antennular somite) carries the antennulae, each of these consisting of a three-segmented peduncle carrying two flagella, the length of the flagella often is of taxonomic importance; the antennulae sometimes are called "first antenna", like the antennae or second antennae they are tactile organs. Somite 3 (= antennal somite) carries the antennae (or second antennae), which consist of a peduncle of 5 segments and a single flagellum. Through fusion of the segments with one another or with the body, the number of actually visible peduncular segments is smaller than 5. The flagellum may be supple or whip-like, or (e.g., in Palinuridae) may be very stiff and strong; in the Scyllaridae the flagellum is transformed to a single plate-like segment, which makes the antennae six-segmented. In some species there is a scaphocerite or antennal scale attached to the second segment of the peduncle. Somites 4 to 9 (i.e., the last 3 cephalon somites and the first 3 of the thorax) carry the mouth parts, appendages which have a function with the dissection and ingestion of food. Somite 4 carries the mandibles, strongly calcified, often molar-like organs that are used for breaking up the more solid food particles, and for chewing. Somites 5 and 6 carry the maxillulae (or first maxillae) and maxillae (or second maxillae) respectively, both are flat leaf-like organs. Somites 7 to 9 (= thoracic somites 1 to 3) carry the first to third maxillipeds, the first is leaf-like like the maxilla, the second and third are more leg-like, especially the third. Somites 10 to 14 (= thoracic somites 4 to 8) carry the five pairs of pereiopods or true legs. The first pereiopod, and sometimes also the second and the third, often (but not always) ends in a chela or pincer. The first leg usually is the largest of the true legs. The legs that do not have pincers are indicated as walking legs as they are mainly used for locomotion.

Dorsally the cephalothorax is encased by the carapace, a single shield-like cover, which extends all the way from the eyes to the last thoracic somite, and sometimes projects beyond the eyes as a narrow median rostrum. Laterally, the carapace extends to the bases of the legs, enclosing the branchial chamber which is a space between the body and the carapace housing the branchia or gills, and situated above the bases of all legs. In some groups, part of the antennular somite is visible dorsally as a triangular plate in front of the anterior margin of the carapace. In the Palinuridae, this so-called antennular plate may carry spines, the number and arrangement of which is of taxonomic importance. In some genera of Palinuridae, the lateral margins of the antennular plate are ridge-like, and swollen, forming a stridulating organ with a process on the inner margin of the antennal peduncle, which rubs over this ridge; when the animal moves its antennae in a certain way, a rasping sound is produced by this organ.

Ventrally, the cephalothorax shows, between the basal parts of the appendages, a central plate, the thoracic sternum, on which the lines between the thoracic somites are usually indicated as grooves. In the females, the sexual openings are visible on the basis (the sixth segment of the leg counting from the tip) of the third pereiopods, in the males these openings are on the basis of the fifth pereiopods. This difference usually is the character that most easily distinguishes male and female lobsters.

The abdomen consists of six separate somites (numbers 15 to 20 on Fig. 2), which are not fused, but movably connected with each other. Each somite is surrounded by a chitinous armour: the dorsal part is called tergite, the ventral part, sternite, and the two lateral parts, pleura (sing. pleuron). The combined abdominal sternites form the abdominal sternum, the combined abdominal tergites, the abdominal tergum. The pleura usually are downward-directed lateral plates, covering externally the pleopods. The shape and ornamentation of the pleura is of taxonomic interest. The appendages of the first 5 abdominal somites (numbers 15 to 19) are the pleopods or swimmerets; they are implanted on the borderline between the sternite and the pleuron. In the male, the first and second pair of pleopods may be transformed into copulation organs, the so-called copulatory stylets, which are often stiff and of characteristic shape. The other pleopods usually consist of a single-segmented peduncle carrying two leaf-like appendages at the top. The pleopods may be reduced or even entirely lacking on some somites. The sixth abdominal somite (= somite 20, being the last body segment) bears the tail fan, which consists of a pair of uropods and the unpaired telson. The uropods actually are the sixth pair of pleopods; they are rather wide and well calcified and usually about as long as the telson. The telson is a plate-like median appendage of the sixth abdominal somite, and sometimes it is considered to represent the seventh abdominal somite. The tail fan, when spread out, can be used for propulsion.

Important taxonomic characters are provided by the carapace (shape, surface sculpturation, spination), eyes (absent, reduced or well developed, position of the orbits), antennulae (length of flagella), antennae (size, shape, dentition, and shape, length and structure of the flagellum), antennular plate (number and arrangement of spines, presence or absence of a stridulating organ), pereiopods (whether or not chelate, size and structure of chelae), thoracic sternum (general shape, shape of anterior margin, presence or absence of tubercles or spines), and abdomen (dorsal sculpturation, shape of the pleura, shape of the tail fan, number of pleopods). Also the colour, and especially the colour pattern of the species may be of great help in rapid identification in the field.

1.2.2 Size

The largest Crustaceans are found among the lobsters. The American lobster (***Homarus americanus***) has been reported to attain a total body length of 64 cm, while the Green rock lobster (***Jasus verreauxi***) may reach a total body length of 60 cm. Several other species of Palinuridae reach sizes between 40 and 50 cm. The smallest lobsters are found among the Scyllaridae: e.g., adult specimens of ***Scyllarus martensii***, reach a total body length of 2.5 cm.

1.2.3 Habitat and Biology

Apart from the freshwater crayfishes (superfamilies Astacoidea and Parastacoidea, which are not treated in this catalogue), all lobsters are marine animals, only a few species enter brackish water. Marine lobsters are found in practically all temperate and tropical seas (between about 65°N and 60°S), being most numerous in the tropics. They occur from the intertidal zone all the way to the deep sea (the deepest record being from almost 3 000 m depth). Many species prefer a rocky substrate with cavities for shelter, but others are found on muddy or sandy bottoms in which they may dig their own burrows. Eelgrass meadows also form a habitat for some species.

The sexes in lobsters are mostly separate, although cases of hermaphroditism (both natural and abnormal) are known. The males impregnate the females (sometimes with the help of the copulatory stylets of the first abdominal somites), and in some species, spermatophores, visible as black or transparent flat masses, are deposited on the female's thoracic sternum. The females produce eggs, which are carried on the pleopods and which usually form a conspicuous mass under the abdomen. After hatching, the larvae pass through several, usually pelagic stages, before molting to the postlarva which is most often benthic. The larvae often bear very little resemblance to the adults, e.g., in the Palinuridea, where the larvae (phyllosoma) are small, flat and perfectly transparent. Larvae are sometimes found far offshore, but the importance of ocean currents in the zoogeography of the lobsters has often been grossly exaggerated.

The greater part of the lobsters seem to be omnivores and scavengers, but few detailed observations are available on feeding habits. Some species are attracted by dead fish put as bait in lobster traps, but others are hardly ever caught in such traps. The Thalassinidea are mostly detritus feeders. Some lobsters also eat live animals; e.g., ***Scyllarides tridacnophaga*** has been observed to attack, open and eat specimens of the giant clam ***Tridacna***.

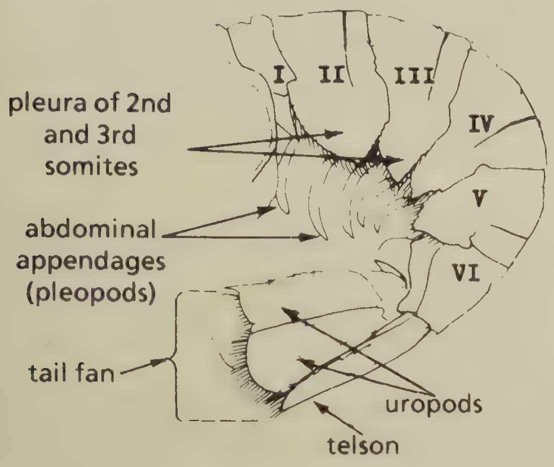
1.2.4 Interest to Fisheries

Lobsters are among the most highly esteemed seafood delicacies. The world catch of lobsters recorded in 1988 (FAO Yearbook of Fishery Statistics, 1990) exceeded 205 000 tons, of which about 127 000 tons corresponded to true lobsters (Family Nephropidae), about 78 000 tons to spiny lobsters (Family Palinuridae) and about 2 100 tons to slipper lobsters (Family Scyllaridae). Although the greatest number of commercial species occurs in tropical waters, the largest lobster catches come from cold-temperate regions like the northwestern Atlantic (Fishing Area 21) with 62 000 tons, and the northeastern Atlantic (Fishing Area 27) with 58 000 tons. Species of genera like ***Homarus*** (about 64 000 tons in 1988), ***Jasus*** (about 14 000 tons) and ***Panulirus*** (about 56 000 tons) form the subject of specialized fisheries and are the basis for important industries. Other species (like ***Nephrops*** , ***Metanephrops*** and ***Palinurus***) often form an important part of mixed catches (e.g. with shrimps), and are sold separately on markets. Many species cannot be obtained in great quantities, but the size of the specimens makes the capture and sale of single individuals profitable locally; in tourist areas such specimens are often sold directly to restaurants, hotels, etc. Several of the deep-sea species need specially equipped ships for their capture, and at present most are not commercially exploitable because of the high operating costs, but better knowledge of their biology and ecology might make them of commercial interest in the future. The species occurring on flat (muddy or sandy) bottom can be obtained by trawls, but a high percentage of lobsters is taken with lobster pots or other traps. Diving and spearing of shallow-water species is mostly done for local consumption or as a sport; spearfishing of lobsters at night with the light of torches, is a traditional way of fishing throughout the tropics. Species burrowing in sand or mud of the intertidal zone can often be captured by digging, or with yabbie pumps or slurp guns (see p. 242).

Since in all lobsters the tail is well developed, the abdominal muscles form the main edible part of the animal. In some Nephropids, the large claws provide enough meat to justify the rather laborious job of cracking the usually very heavy shell of these appendages. The Nephropoid and Palinuroid lobsters are considered a delicacy almost everywhere. They are used almost exclusively for human consumption, seldom as bait. The Thalassinoidea, on the other hand, are only rarely used as food, but far more often as bait.

1.3 Illustrated Glossary of Technical Terms

Abdomen - The posterior part of the body (tail) of a lobster consisting of 6 well discernable somites with their appendages, and including the tail fan (Figs 2,3).


I
II
III
IV
V
VI
pleura of 2nd and 3rd somites
abdominal appendages (pleopods)
tail fan
uropods
telson

somites numbered I to VI

Fig. 3 Abdomen (tail) in lateral view

Antenna (pl. antennae) - The appendage of the third cephalon somite, consisting of a five-segmented peduncle and a flagellum (Figs 2,4,6,9,11,14). Through fusion of the segments with the body or with each other, the peduncle may seem to consist of fewer segments. The flagellum is usually multi-articulated, it may be supple or very stiff; in the Scyllaridae the flagellum is transformed into a single plate-like segment, similar to the peduncular segments. The antenna sometimes is named "second antenna", and the antennula, "first antenna". Both, the antenna and the antennula are tactile organs (feelers).

Antennal angle - An angular curve on the anterior margin of the carapace just below the orbit. On this place, the antennal spine (q.v.*), if present, is implanted.

Antennal flagellum, see antenna

Antennal plate - Sometimes used for antennular plate (q.v.).

Antennal somite - The third somite of the body (Fig. 2) (at the same time the third cephalon somite). It carries the antennae.

Antennal spine - A spine on the anterior margin of the carapace just below the orbit (Fig. 5).

Antennula (pl. antennulae). - The appendage of the second cephalon somite, consisting of a three-segmented peduncle and two flagella (Figs 2,4,6,9, 11,14). The length of the flagella in some groups is of taxonomic importance. The antennula also is called first antenna; the antenna then is named second antenna.

Antennular plate, see antennular somite.

Antennular somite - The second somite of the body (Fig. 2) (at the same time the second cephalon somite). It carries the antennulae (Figs 4,6). Sometimes the dorsal surface of the antennular somite is visible in front of the carapace and between the bases of the antennae as a triangular plate, the so-called antennular plate, which in Palinuridae may be armed with dorsal spines or spinules, and which in some genera has the lateral margins swollen and forming part of a stridulating organ (q.v.) (Fig 4). The antennular plate sometimes is referred to as antennal plate or inter-antennal plate.

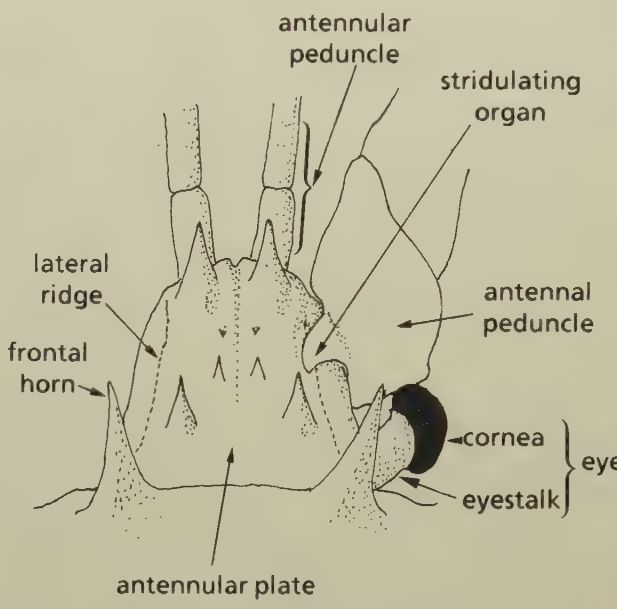


Fig. 4 Antennular somite of a palinurid lobster (left antenna and eye omitted)

Anterolateral teeth - In Scyllaridae, the teeth of the lateral margin of the carapace, in front of the cervical incision (Fig. 6).

Arthrobranch, see branchium.

Basis - The sixth segment of a pereiopod, counted from the tip of the leg; it is situated between the ischium and the coxa (Figs 7,12). See pereiopod.

Branchial carina - A longitudinal carina over each lateral half of the carapace, in Scyllaridae extending from the orbit backward and bisected by the cervical groove into an anterior and a posterior part (Fig. 6,29).

Branchial chamber - The space between the thorax and the lateral part of the carapace above the bases of the legs. The respiratory water current is pumped through the full length of the branchial chamber by action of some of the mouth parts.

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[*] The abbreviation q.v. (for "quod vide" = which see), placed after a term is a cross reference to that term in the glossary

Branchiostegal spine - A spine on the anterior margin of the carapace below the antennal spine (Fig. 5).

Branchium (pl. branchia) - Gill. The gills are found on and near the bases of the thoracopods in the branchial chamber. They are whitish, plumiform organs that are placed on the epipods (the podobranchia), at the articulation of the leg with the body (arthrobranchia), or on the body itself (pleurobranchia) (Fig. 12). Water is pumped through the branchial chamber and gas exchange takes place through the thin wall of the gill filaments.

Carapace, or dorsal shield (Figs 5,6) - A shield-like lateral extension of the thoracic somites, which covers the cephalothorax dorsally and extends from the eyes to the posterior margin of the last thoracic somite. It is cylindrical or angular, and laterally fits snugly against the bases of the pereiopods, enclosing the branchial chamber above the bases of the pereiopods. The carapace may end anterodorsally in a rostrum which is placed between the eyes. The structure, pubescence, sculpturation (grooves and spines) of the carapace are of taxonomic importance.

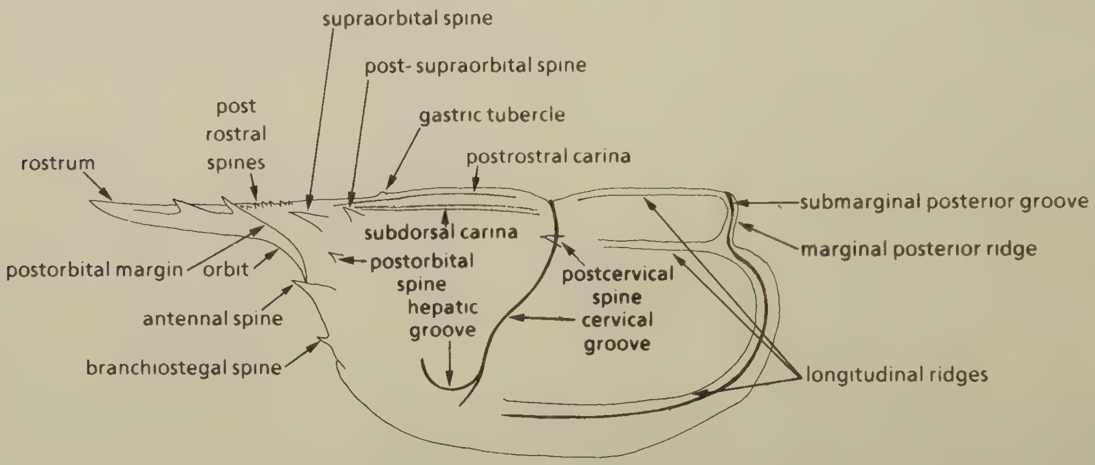

supraorbital spine
post-supraorbital spine
post rostral spines
gastric tubercle
rostrum
postrostral carina
submarginal posterior groove
subdorsal carina
marginal posterior ridge
postorbital margin
orbit
postorbital spine
postcervical spine
antennal spine
hepatic groove
cervical groove
branchiostegal spine
longitudinal ridges

Fig. 5 **Lateral view of a nephropid carapace**

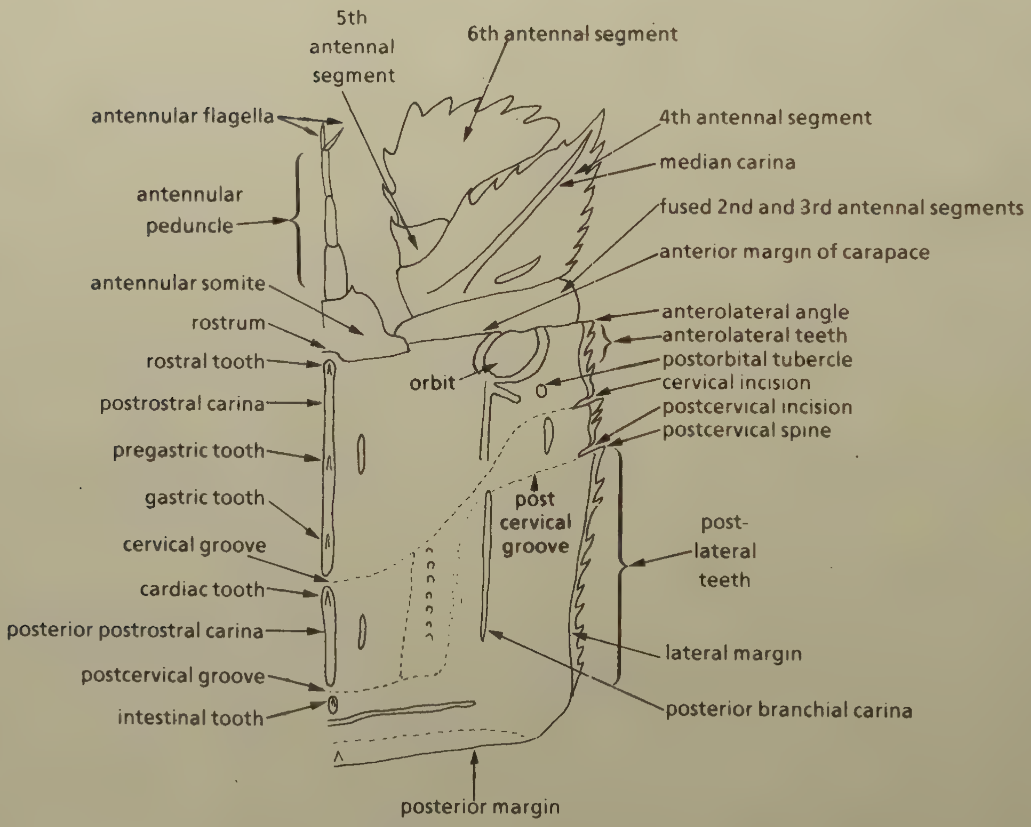

5th antennal segment
6th antennal segment
antennular flagella
4th antennal segment
median carina
antennular peduncle
fused 2nd and 3rd antennal segments
anterior margin of carapace
antennular somite
anterolateral angle
rostrum
anterolateral teeth
rostral tooth
postorbital tubercle
orbit
cervical incision
postrostral carina
postcervical incision
postcervical spine
pregastric tooth
post cervical groove
gastric tooth
post-lateral teeth
cervical groove
cardiac tooth
posterior postrostral carina
lateral margin
postcervical groove
posterior branchial carina
intestinal tooth
posterior margin

Fig. 6 **Schematic dorsal view of right half of scyllarid carapace and cephalic appendages showing various regions, spines, grooves, teeth, etc.**

Cardiac tooth - In Scyllaridae, the median tooth on the dorsal surface of the carapace immediately behind the cervical groove (Fig. 6). Sometimes the tooth is low and knob-like, and then may be indicated as cardiac knob.

Carina (pl. carinae) - Ridge or crest.

Carpus - The third segment of a pereiopod counted from the tip of the leg; it is situated between the propodus and merus (Figs 7,12). See pereiopod.

Cephalic - Belonging to the cephalon (q.v.)

Cephalon, or head - In the Decapoda, the cephalon is formed by the first 6 somites of the body, and is fused with the 8 thoracic somites to the cephalothorax. The first cephalic somite (= the ophthalmic somite) carries the eyes, the second (= antennular somite), the antennulae, the third (= antennal somite), the antennae, the fourth, the mandibles, the fifth, the maxillulae, and the sixth, the maxillae (Fig. 2).

Cephalothorax - The anterior 14 somites of the Decapod body, consisting of the 6 cephalon somites and the 8 thoracic somites (Figs 2,9,11,14). These 14 somites are fused to a single entity and the division between them can only rarely be observed (e.g., on the thoracic sternum). As each of the somites bears a single pair of appendages, the position of the fused somites can be ascertained by the position of these appendages. See also cephalon and thorax. Sometimes, but incorrectly so, the term cephalothorax is used instead of carapace.

Cervical groove - An often deep, transverse groove over the middle of the carapace, the lateral parts of which are usually curved forward (Figs 5,6).

Cervical incision - An incision on the lateral margin of the carapace in Scyllaridae at the point where the cervical groove would meet that margin (Fig. 6).

Chela (pl. chelae), or pincer (Figs 7,9) - A scissor-like organ carried by many lobsters on the first pereiopods, sometimes also found on some or all of the other pereiopods, sometimes entirely lacking. The chela is formed by the last two segments of the leg, viz., propodus and dactylus, and consists of a palm and two fingers. The upper or movable finger is formed by the dactylus, which articulates with the propodus at the end of the palm; it opposes the fixed finger, which is immovably connected with the palm and forms with it the propodus. The opposing edges of the two fingers, the cutting edges, may carry teeth. The presence or absence of chelae, as well as their shape, size and ornamentation, can be of great taxonomic value. The Nephropoidea have chelae on the first three pairs of pereiopods, the first of which usually is very large. In the Palinuroidea the first 4 legs have no true chelae, but the females of most species have a small chela on the fifth pereiopod. The Thalassinidea sometimes have a true chela on the first and second pereiopods, but often they only have a subchela (q.v.).

Chelate - Carrying a chela or pincer.

Cheliped - A leg carrying a pincer or chela (Figs 2,7), e.g., the first three pereiopods in Nephropidae are chelipeds.

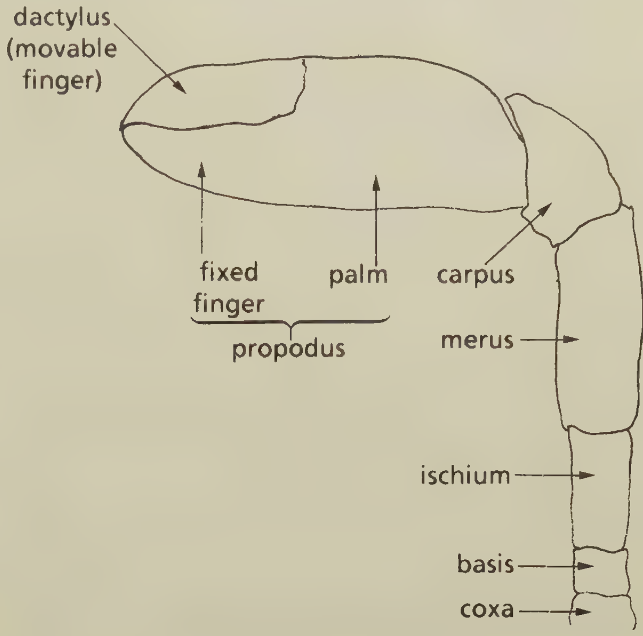


Fig. 7 Schematic illustration of a cheliped

Copulatory stylets - The first pleopod of the male in several Nephropoidea, which has been transformed into an often slender, rigid organ that plays a role in the copulation (Fig. 8).

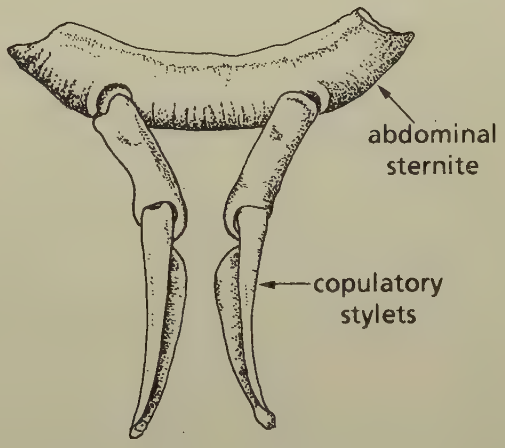


Fig. 8 First pair of pleopods of *Homarus* transformed into copulatory stylets

Cornea - The distal part of the eye that carries the visual elements and is usually pigmented (Figs 2,4).

Coxa - The basal segment of a pereiopod, the seventh counted from the tip of the leg; it is followed by the basis (Figs 7,12).

Crushing claw - The larger first chela of some Nephropidae, in which the teeth on the cutting edge are wide and molar-like (Fig. 9). The crushing claw is used to crack molluscs and other hard objects.

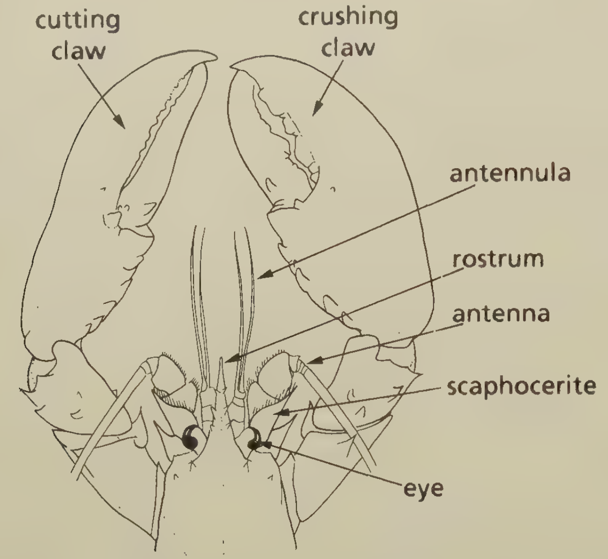


Fig. 9 **Anterior part of cephalothorax of *Homarus* (dorsal view)**

Cutting claw - The smaller first chela of some Nephropidae, in which the cutting edges are serrated, having a single row of narrow sharp teeth (Fig. 9). This claw is used for cutting and breaking. It usually forms a pair with the crushing claw (q.v.).

Dactylus - The ultimate segment of a pereiopod; in a chela the dactylus is the movable finger (Figs 7,10,12, 16).

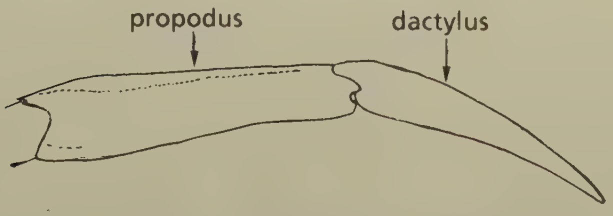


Fig. 10 **Dactylus and propodus of a walking leg**

Diaeresis - A transverse articulation in the distal part of the exopod of a uropod. The diaeresis is visible as a complete or incomplete line, sometimes with a row of small spinules along its anterior margin; the outer margin of the exopod of the uropod may have a spine or tooth at the spot where the diaeresis joins it (Fig. 17). The presence or absence of a diaeresis is of taxonomic importance.

Distal - Farther away from the body (or centre of the body). The distal part of an appendage is its tip, i.e. the part farthest away from the articulation of the appendage with the body. The distal part of the abdomen is the tail fan, i.e. the part farthest away from centre of the body. Opposite term: proximal.

Endopod, or endopodite - The inner branch of a biramous leg (Figs 2,12,15,17). Most, or all appendages can be derived from a biramous leg, which consists of a peduncle of 2 or 3 segments, carrying two appendages, the endopod and the exopod. In the thoracic appendages of the lobsters, the exopod has disappeared or is present as a reduced flagellum-bearing organ, while the distal 5 segments of the pereiopods represent the endopod. In most pleopods and in the uropod the biramous construction of the appendage is still clearly apparent, and here the exo- and the endopod can be of about the same size. Opposite term: exopod.

Epipod - A usually small, oval or elongate leaf-like appendage on the outer margin of the first segment (coxa) of a thoracopod (Fig. 12). Sometimes the epipod carries a gill, the so-called podobranch.

Epistome - The median area on the ventral surface of the cephalothorax situated between the anterior margin of the oral field and the bases of the antennae and antennulae (Fig. 11).

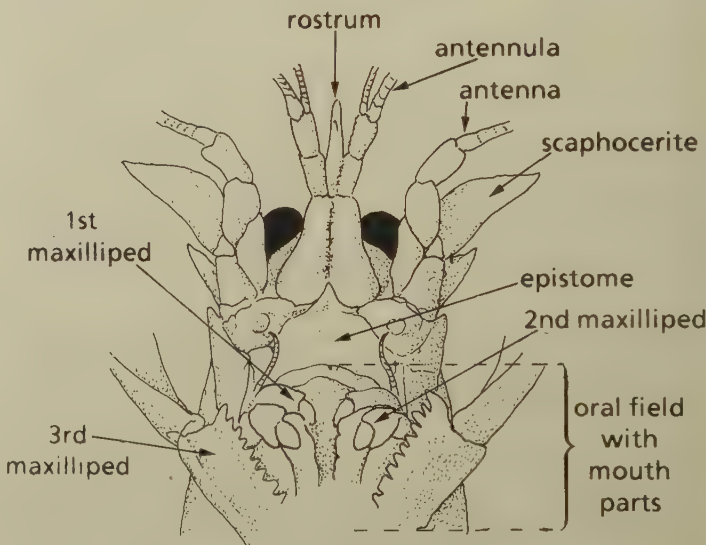


Fig. 11 **Anterior part of cephalothorax of *Nephrops* (ventral view)**

Exopod, or exopodite - The outer branch of a biramous appendage (see under endopod) (Figs 2,12,15,17). In the lobsters, the exopod is absent from the pereiopods, but still present in the maxillipeds where it forms an often flagellum-carrying appendage of the endopod. In most pleopods and the uropods the exopod is about as large as, or sometimes even larger than, the endopod. Opposite term: endopod.

Eye - Organ of vision. A pair of eyes is placed on the first somite (= first cephalon somite). In most cases the eye is movably connected with the body and consists of a stalk of one or two segments, the distal of which carries the cornea (Figs 2,4,9,11). The cornea (q.v.) consists of the optical elements and usually is pigmented. In some species the eye is reduced, the optical elements may be few or entirely absent, and also the pigment can be absent; the eye then usually becomes small and bullet-shaped and may even become immovably fused to the body.

Fixed finger, see chela.

Flagellum (pl. flagella) - A usually whip-like, multiarticulated appendage of the antennula or the antenna, implanted at the top of the peduncle (Figs 2,6). The antennula carries two flagella, the antenna one. In most Nephropoidea the antennal flagellum is flexible and whip-like, in most Palinuridae it is rather rigid and may be spinulate. In the Scyllaridae, the flagellum is reduced to a single large plate, which looks as if it were the 6th segment of the antenna (Fig. 6). Flagella are also found on some of the exopods of the mouth parts (Fig.12).

Frontal horn - In Palinuridae, a large, and broad, often curved tooth, that is placed on the anterior margin of the carapace just behind and above the eyes. The frontal horns usually are the largest teeth on the carapace and are directed over the orbit (Figs 4,14).

Gastric tooth - In Scyllaridae, a tooth in the median line of the carapace before the cervical groove. It usually is placed rather close to the cervical groove and may be preceded by the pre-gastric tooth (q.v.) (Fig. 6).

Gastric tubercle - A tubercle on the dorso-median line of the carapace of some Nephropidae, situated between the base of the rostrum and the cervical groove (Fig. 5).

Gill, see branchium.

Head, see cephalon.

Hepatic groove - A groove in the anterolateral part of the carapace branching off from the lateral part of the cervical groove and directed forward (Fig. 5).

Interantennal plate, see antennular somite.

Intermediate carina - A longitudinal carina over the posterior part of the carapace behind the cervical groove, placed between the median carina and the branchial carina (Fig. 29)

Intestinal teeth or **tubercles** - The median row of teeth (or tubercles) on the carapace between the post-cervical groove and the posterior margin of the carapace (Figs 6,14).

Ischium - The fifth segment of a pereiopod counted from the tip of the leg; it is situated between merus and basis (Figs 7,12). See pereiopod.

Lateral carina - A longitudinal carina over the posterior part of the carapace behind the cervical groove. The lateral carina is situated between the branchial carina and the lateral margin of the carapace (Fig. 29).

Mandible - The first of of the mouth parts, located on the fourth somite (= cephalon somite 4), near the opening of the mouth (Fig. 2). It is a sturdy, heavily chitinized organ consisting of one piece that ends in a row of teeth and has a tubercular, molar-like area; it carries a usually three-segmented palp. It is used for breaking up and chewing the food.

Marginal posterior ridge of the carapace - The ridge that forms the extreme posterior margin of the carapace, often becoming less distinct laterally (Figs 5,14).

Maxilla, or second maxilla - The third of the mouth parts, placed on the sixth somite (this is the sixth, and last, cephalon somite) (Fig. 2). Like the maxillula, and in contrast to the mandible, the maxilla is a flat and flexible organ.

Maxilliped - The three maxillipeds (first, second, and third) are appendages of somites 7 to 9 (= thoracic somites 1 to 3) (Fig. 2), and are considered to belong to the mouth parts because of their role with the ingestion of food. The first maxilliped is flat and leaf-like, somewhat similar to the maxilla; the second and the third, especially the latter, are more leg-like in shape (Fig. 11).

Maxillula, or first maxilla - The second of the mouth parts, being the appendage of the fifth somite (= fifth cephalon somite) (Fig. 2). It is small, flat and flexible and placed close to the mandible.

Median carina - In Nephropidae the longitudinal dorso-median carina of the carapace behind the cervical groove (Fig. 29)

Merus - The middle segment of a pereiopod, the fourth counted from either end (see pereiopod) (Figs 7,12).

Mouth parts - A general term for the appendages of somites 4 to 9 (= cephalon somites 4 to 6 and thoracic somites 1 to 3) (Fig. 2). They are the, often small, appendages preceding the often large first pereiopods, and are placed around and behind the mouth opening on the ventral side of the body (Fig. 11). They include in backward sequence: the mandible, maxillula, maxilla and the first, second and third maxillipeds. They all play a role in the dissection and ingestion of food.

Ophthalmic somite - The first somite (= first cephalon somite) (Fig. 2). It carried the eyes.

Oral field - The usually sunken, median area on the anterior part of the ventral surface of the cephalothorax, containing the mouth parts (= oral parts) (Fig. 11).

Orbit - The cavity in which the eyes are implanted. In many species, the orbit is only defined by the postorbital margin, which forms part of the anterior margin of the carapace; in those cases, the orbit is open anteriorly (Fig. 5). In some Scyllaridae the anterior margin of the carapace practically surrounds the eye and the orbit is then closed or almost closed (Fig. 6).

Palm - The part of the chela, or pincer, that bears the fingers. It is part of the propodus, the rest of the propodus forms the fixed finger (Fig. 7).

Peduncle, see antenna, antennula, pleopod and uropod.

Pereiopod, also written pereopod or peraeopod - The thoracic appendages behind the mouth parts, i.e. the appendages of somites 10 to 14 (= thoracic somites 4 to 8) (Figs 2,12). The pereiopods consist of seven segments, these are, from proximal to distal: coxa, basis, ischium, merus, carpus, propodus, and dactylus (Fig. 12). The pereiopods can be divided into chelipeds (those that carry a chela, Figs 2,7) and walking legs (those that do not, Figs 2,10).

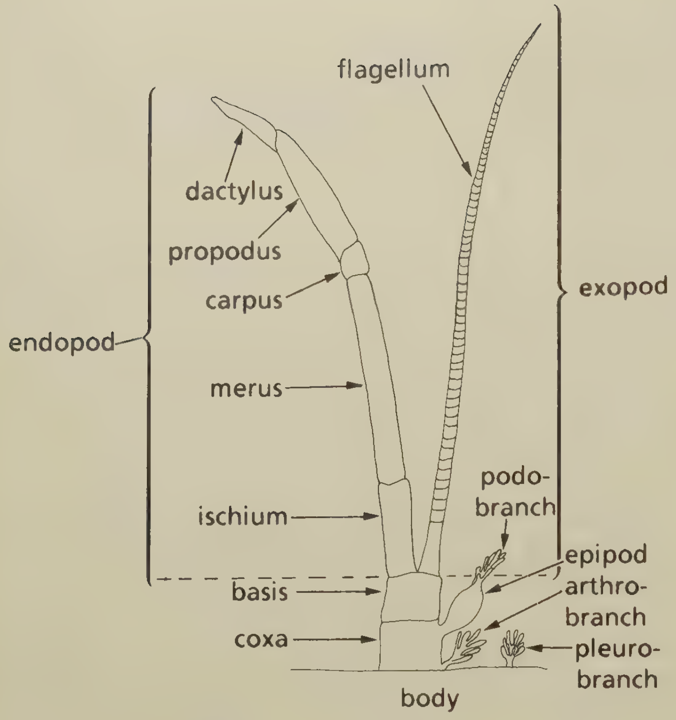


Fig. 12 Schematic illustration of a thoracopod

Phyllosoma or phyllosome - The pelagic larva of Palinuroidea, in which both the cephalothorax and the abdomen appear as glassy transparent, nearly circular, very thin and flat discs (Fig. 13). These larvae are so different from the adults that they originally were described under a separate genus without any connection with the Palinuroidea.

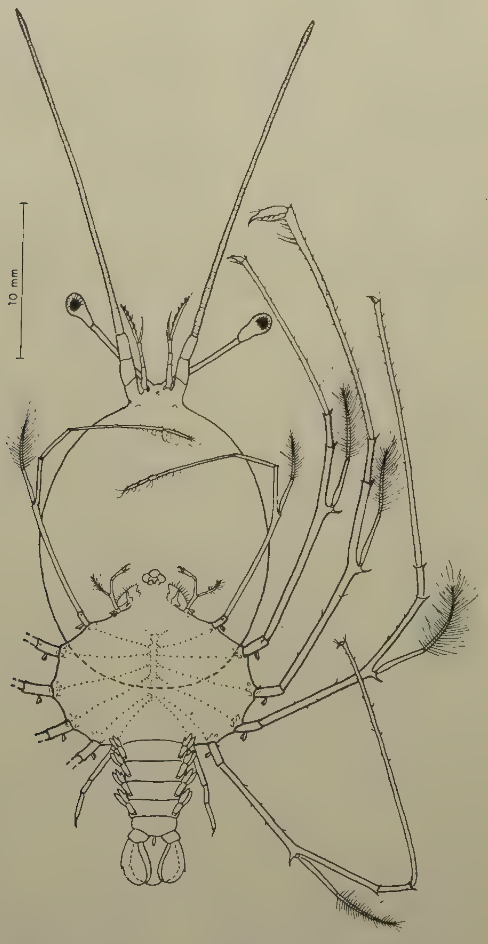


Fig. 13 Phyllosoma larva (*Panulirus gracilis*) (from Johnson, 1971)

Pleopod - Appendage of any of the first 5 abdominal somites, usually formed by an unsegmented peduncle which carries two branches usually formed of a single flat, leaf-like and oval segment (Figs 2,3,15). The outer of these branches is the exopod, the inner the endopod. The pleopods may be reduced or entirely absent from some somites, the endopod may have an appendix. In some species, the pleopods of the first or first two abdominal somites may be transformed into rigid copulatory stylets (Fig. 8), which play a role during copulation. In females the pleopods may be larger and wider than in males, especially when the females carry eggs. The eggs are fastened to the pleopods and are carried as a conspicuous mass under the abdomen, the mass being protected on the outer side by the pleopods.

Pleurobranch, see branchium.

Pleuron (pl. pleura) - The lateral part of the chitinous ring that surrounds each somite, the dorsal part being the tergite, the ventral the sternite (Figs 3,15). The pleura of the abdominal somites are often well developed and show as lateral plates that are directed downward and protect the pleopods; together with the sternites they may form a gutter-like cavity on the lower surface of the abdomen, which holds the pleopods and the eggs. The pleura may be either large, rounded or triangular, or small and short. Their sculpturation, shape and spination are important taxonomic characters.

Podobranch, see branchium.

Postcervical groove - A roughly transverse groove on the carapace in Scyllaridae, some distance behind and roughly parallel to the cervical groove (Fig. 6).

Postcervical incision - An incision on the lateral margin of the carapace in Scyllaridae, behind the cervical incision and usually slightly closer to it than to the posterior end of the carapace (Fig. 6). The cervical and postcervical incisions may divide the lateral margin into 3 parts.

Postcervical spine - A spine on the dorsal surface of the carapace, placed immediately behind the cervical groove (Figs 5,6).

Postcervical teeth or **tubercles** - In ***Puerulus***, the median row of teeth or tubercles on the carapace between the cervical and intestinal grooves (Fig. 14).

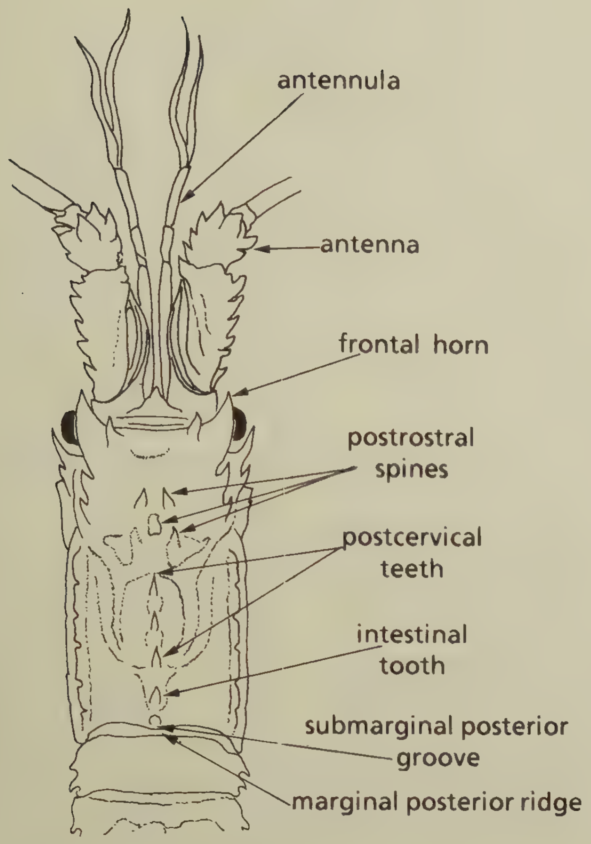


Fig. 14 Cephalothorax of *Puerulus*
(dorsal view, pereiopods omitted)

Posterolateral teeth - In Scyllaridae, the teeth of the lateral margin of the carapace placed behind the postcervical incision (Fig. 6).

Postorbital margin - Part of the anterior carapace margin which defines the orbit (Fig. 5).

Postorbital spine - A spine on the carapace placed at some distance behind the orbital margin (Fig. 5).

Postrostral carina - A median ridge on the dorsal part of the carapace, which extends from the base of the rostrum backward, often to the posterior margin of the carapace (Figs 5,6).

Postrostral spines - Spines in the dorsomedian part of the carapace placed immediately behind the base of the rostrum, either in the median line or submedially (Figs 5,14).

Post-supraorbital spine - A spine placed at a short distance behind the supraorbital spine on the carapace (Fig. 5).

Pregastric tooth - In Scyllaridae, a tooth in the median line of the anterior part of the carapace (before the cervical groove). It is placed before the gastric tooth and behind the rostral tooth (Fig. 6).

Propodus - The one but last segment of a pereiopod (q.v.), situated between the dactylus and the carpus (Figs 7,10, 12,16). In a chela the propodus forms the palm and the fixed finger.

Proximal - Closer to the body (or centre of the body). The proximal part of an appendage is its base, i.e. the part closest to the body. The terms proximal and distal can be used regardless of the position in which the appendage is directed, while terms like ventral, dorsal, anterior and posterior in such a movable organ may be confusing.

Puerulus stage - The first postlarval stage of Palinurid lobsters. So named before the postlarval development of the Palinuridae was known; these animals were incorrectly considered to belong to the genus ***Puerulus.***

Rostral tooth, see rostrum.

Rostrum - A prolongation of the median part of the anterior carapace margin, which projects forward between and often beyond the eyes (Figs 5,6,9,11). The rostrum can be of various shapes; in lobsters it is usually dorsoventrally depressed and often bears teeth. In many species the rostrum is absent or reduced to a single spine or angle (e.g., in Palinuroidea); in most Nephropoidea it is well developed. In Scyllaridae it is hardly noticeable, but for the presence of a tooth (rostral tooth) or tubercle (Fig. 6).

Scaphocerite - A scale-like appendage of the antennal peduncle, which is inserted on the outer part of the distal margin of the second peduncular segment (Figs 9,11). The scaphocerite is generally considered to be the exopodite of the antenna. It usually is small and may be armed with teeth. In some species it lacks altogether.

Sculpturation - The presence of grooves, ridges, spines, teeth, tubercles or granules on the exposed parts of the body.

Segment - A single part of an articulated unit. In the present catalogue, the term "segment" is only used for the segments of the appendages, the body segments are always indicated as "somites" (q.v.). A pereiopod (q.v.) has seven segments.

Somite or body segment - Any of the 20 segments into which the body is divided (Fig. 2). Each somite is surrounded by a chitinous cover, the dorsal part of which is termed tergite (q.v.), the ventral part sternite (q.v.) and the lateral parts, pleura (singular: pleuron, q.v.) (Figs 3,15).

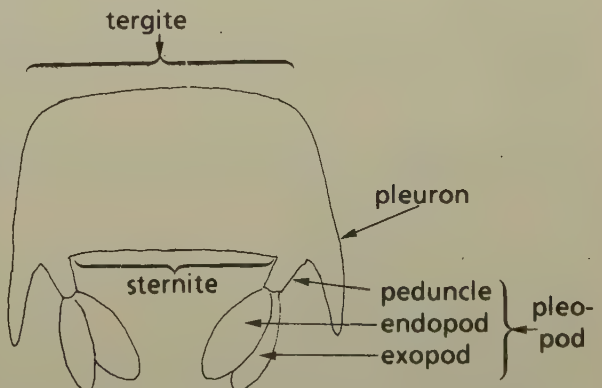


Fig. 15 Schematic cross-section through an abdominal somite

Spermatophore - A viscous mass, containing the spermatozoa embedded in a secretion from the sperm duct, which during copulation is deposited by the male on the thoracic sternum of the female in some lobsters. In the Palinuroidea the spermatophores may be visible as black, tar-like or transparent gelatinous deposits covering the posterior part of the female sternum.

Stalk, or peduncle (q.v.), see eye.

Sternite - The ventral part of the chitinous ring that surrounds each somite (the other parts are the dorsal tergite and the two lateral pleura) (Figs 8,15). Together, the various sternites form the sternum, e.g., the thoracic sternum is the sum of the thoracic sternites.

Sternum, see sternite.

Stridulating organ - An organ formed by two parts of the body that produce a sound rubbing against each other (Fig. 4). In some Palinurid genera, the lateral margins of the antennular plate are ridge-like and thickened; a projection of the antennal peduncle rubs over this ridge when the antenna is moved in a special way, thereby producing a rasping sound, which evidently is a means of communication.

Stylet, copulatory, see copulatory stylet.

Subchela - An incomplete chela, in which the dactylus does not oppose a fixed finger, but, when the chela is closed, strikes against a broadened part of the propodus (Fig. 16).

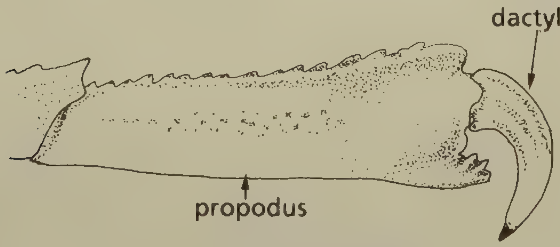


Fig. 16 Subchela *(Justitia)*

Subdorsal carina - A ridge at either side of the mid-dorsal line of the carapace, placed close to it and running parallel with it (Fig. 5). The subdorsal carinae are always paired.

Submarginal posterior groove of the carapace - An often deep groove parallel to the posterior margin of the carapace and separated from it by the marginal posterior ridge (Figs 5, 14).

Supraorbital spine - A spine on the carapace placed obliquely above and somewhat behind the orbit (Fig. 5).

Swimmeret, see pleopod.

Tail, see abdomen.

Tail fan - A fan-like organ at the end of the abdomen, consisting of the telson, flanked on either side by the uropods (Figs 3,17).

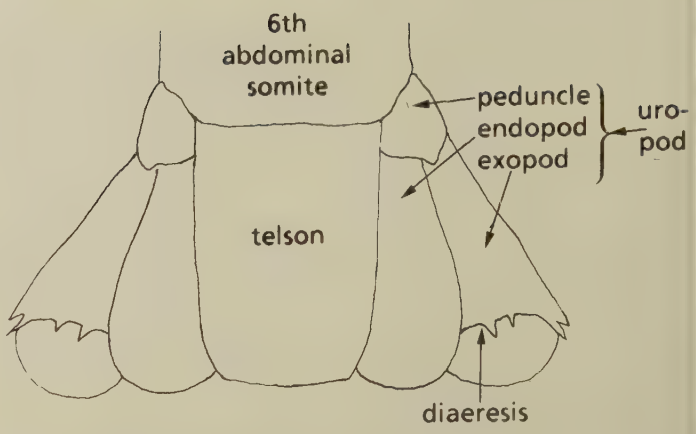


Fig. 17 Schematic illustration of tail fan

Telson - A median appendage at the end of the sixth abdominal somite, usually longer, at least not much shorter than the somite itself, and sometimes considered to be the seventh abdominal somite. The telson has no appendages (Figs 2,3,17).

Tergite - The dorsal part of the chitinous ring that surrounds each somite (the other parts are the ventral sternite and the two lateral pleura) (Fig. 15). Together the various tergites form the tergum, e.g., the abdominal tergum is the sum of the six abdominal tergites.

Tergum, see tergite.

Thoracic somite, see thorax.

Thoracopod - Any of the 8 appendages of the thorax. The thoracopods consist of 3 pairs of maxillipeds (appendages of thoracic somites 1 to 3) and 5 pairs of pereiopods (appendages of thoracic somites 4 to 8) (Figs 2,12).

Thorax - The middle of the three main parts of the body (cephalon, thorax, and abdomen). It is formed by the 7th to 14th somites (= thoracic somites 1 to 8) and bears the thoracopods (q.v.) (Fig. 2). The somites of the thorax are fused with those of the cephalon and so form the cephalothorax (q.v.). Dorsally and laterally, the lines between the thoracic somites are not noticeable; ventrally, however, they may show as transverse grooves on the sternum.

Uropod - One of the pair of pleopods of the sixth abdominal somite (Fig. 2). In contrast to the pleopods of the preceding somites, the uropods are stiff and heavily chitinized; they are well developed and form, together with the telson, the tail fan. They consist of an unsegmented peduncle, which bears at its distal end the usually blade-shaped exo- and endopods, these can be folded against each other and sometimes under the telson (hence the name tail fan) (Figs 3,17).

Walking leg - A pereiopod that does not carry a chela. In the Nephropidae, the first three pereiopods are chelipeds, the last two are walking legs (Figs 2,10). The main function of the walking legs is locomotion, while that of the chelipeds is feeding.

2. SYSTEMATIC CATALOGUE OF SPECIES

SUBORDER **MACRURA REPTANTIA** Bouvier, 1917

Macrura Reptantia Bouvier, 1917, Résultats Campagnes scientifiques Prince Albert I Monaco, 50:7,8,9.

The suborder Macrura Reptantia consists of three infraorders: Astacidea (marine lobsters and freshwater craysfishes), Palinuridea (spiny lobsters and slipper lobsters) and Thalassinidea (mud lobsters). The infraorder Astacidea contains three superfamilies of which only one (the Nephropoidea) is considered here. The remaining two superfamilies (Astacoidea and Parastacoidea) contain the freshwater crayfishes. The superfamily Nephropoidea (40 species) consists almost entirely of commercial or potentially commercial species, and their few non-commercial representatives are dealt with here also, so as to give a complete picture of this group.

The infraorder Palinuridea, also contains three superfamilies (Eryonoidea, Glypheoidea and Palinuroidea) all of which are marine. The Eryonoidea are deepwater species of insignificant commercial interest and are only treated superficially in this catalogue. The Glypheoidea, an almost exclusively fossil group, contains a single recent species, which is treated here. All species of the superfamily Palinuroidea (total about 120 species) are included in the catalogue. Members of the genus ***Scyllarus*** (over 40 species) are listed but only 7 species are treated in detail because they are the only ones known to be of (potential) interest to fisheries.

The third infraorder, the Thalassinidea, contains a single superfamily, the Thalassinoidea which contains around 100 species. Only a few representatives of this superfamily are known to be used as food and bait and hence only these few species are treated in detail in this catalogue.

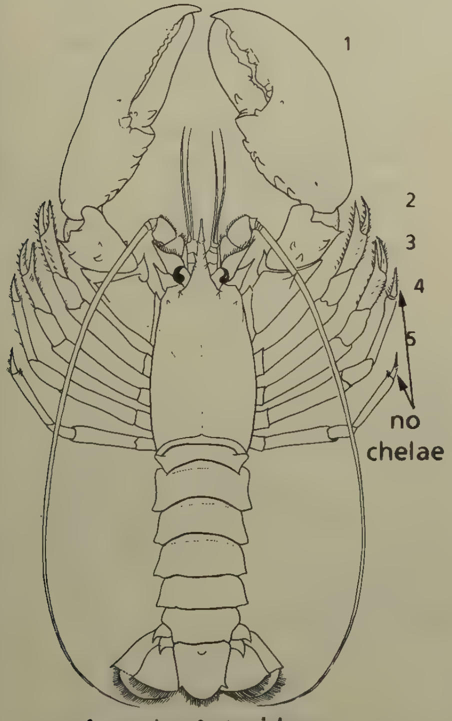
Key to the three Infraorders and their Superfamilies

1a. First three pairs of pereiopods with true chelae, the first pair the largest and most robust

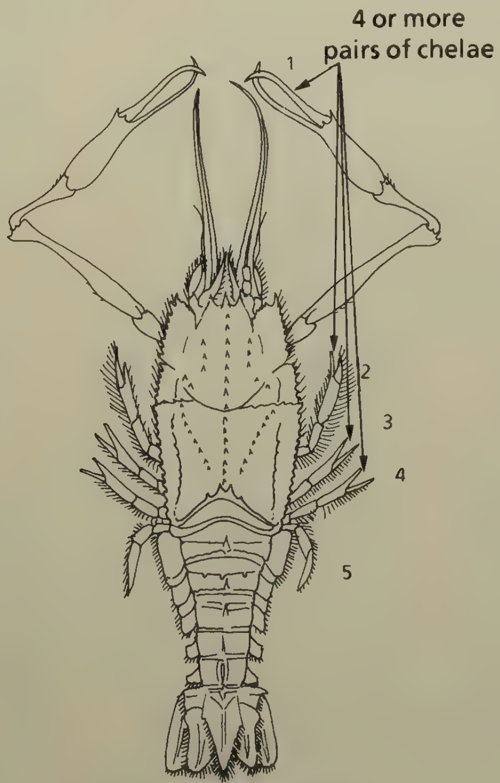
- **2a.** Fourth pereiopod, and usually also the fifth, without true chelae. Carapace cylindrical, not flattened (Fig. 18) .... Infraorder **Astacidea**, Superfamily **Nephropoidea**
- **2b.** All pereiopods, or at least the first four, with true chelae. Carapace flattened (Fig. 19). Deep-sea species .... Infraorder **Palinuridea**, Superfamily **Eryonoidea**, Family **Polychelidae**

1b. Third pereiopod never with a true chela, in most groups chelae also absent from first and second pereiopods

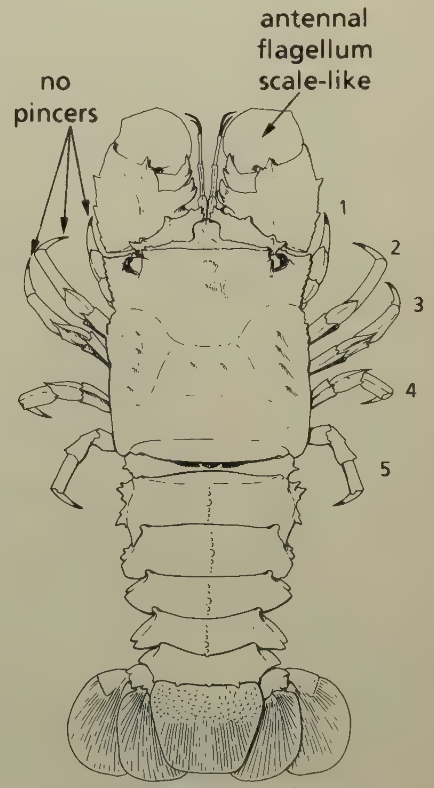
- **3a.** Antennal flagellum reduced to a single broad and flat segment, similar to the other antennal segments (Fig. 20) .... Infraorder **Palinuridea**, Superfamily **Palinuroidea**, Family **Scyllaridae**
- **3b.** Antennal flagellum long, multi-articulate, flexible, whip-like, or more rigid



Infraorder **Astacidea**
Superfamily **Nephropoidea**
Fig. 18



Infraorder **Palinuridea**
Superfamily **Eryonoidea**
Family **Polychelidae** **Fig. 19**



Infraorder **Palinuridea**
Superfamily **Palinuroidea**
Family **Scyllaridae** **Fig. 20**

4a. Epistome long, about 1/3 of carapace length. Eyes on a median elevation of the cephalon (Fig. 21) .. Infraorder **Palinuridea**
Superfamily **Glypheoidea**
Family **Glypheidae**

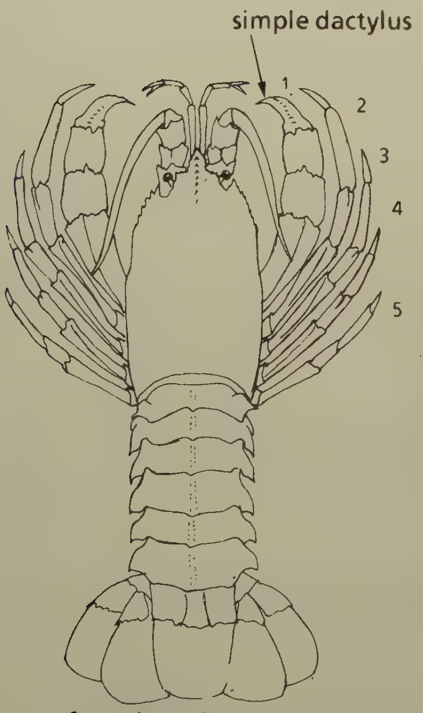
4b. Epistome short, far shorter than 1/3 of the carapace. Eyes not placed on an elevation of the cephalon

5a. Carapace with numerous strong and less strong spines and two frontal horns over the eyes. Rostrum absent or reduced to a single spine. Legs 2 to 4 (usually also 1) without chelae or subchelae (Fig. 22) .. Infraorder **Palinuridea**
Superfamily **Palinuroidea**
Family **Palinuridae**

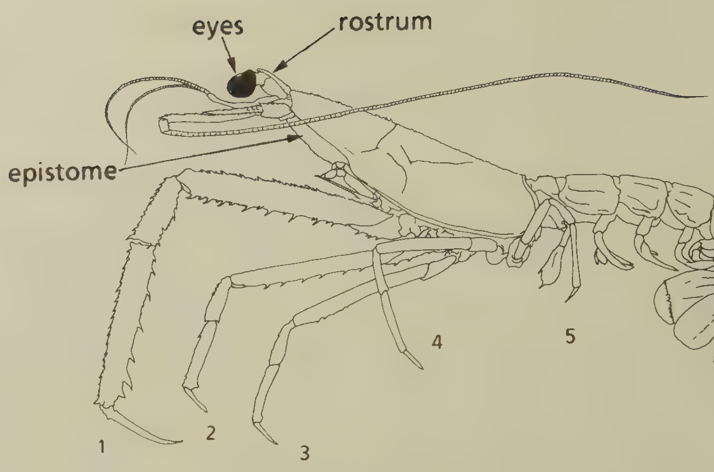
5b. Carapace with at most a few spines; no frontal horns. Rostrum present, even though sometimes small. Legs 1 and 2 simple, chelate, or subchelate

6a. First pereiopods simple, rostrum flat, broad and triangular or broadly oval (Fig. 23) .... Infraorder **Palinuridea**
Superfamily **Palinuroidea**
Family **Synaxidae**

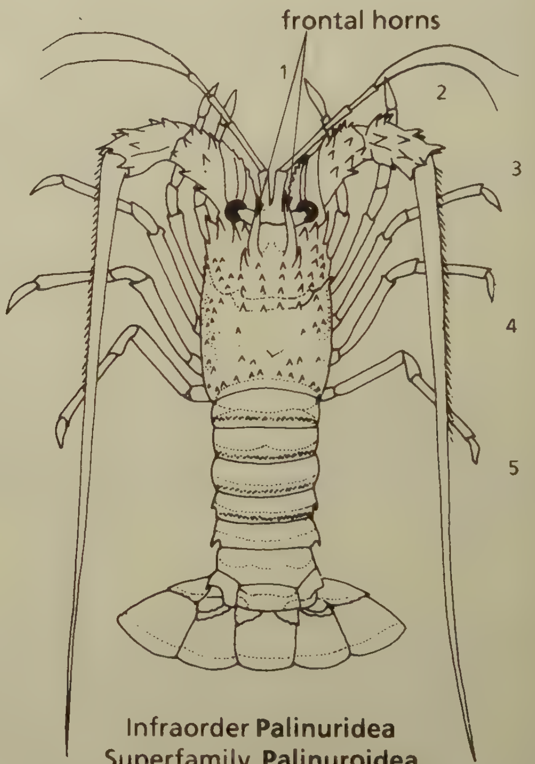
6b. First pereiopod chelate or subchelate. Rostrum of diverse shapes (Fig. 24) ... Infraorder **Thalassinidea**



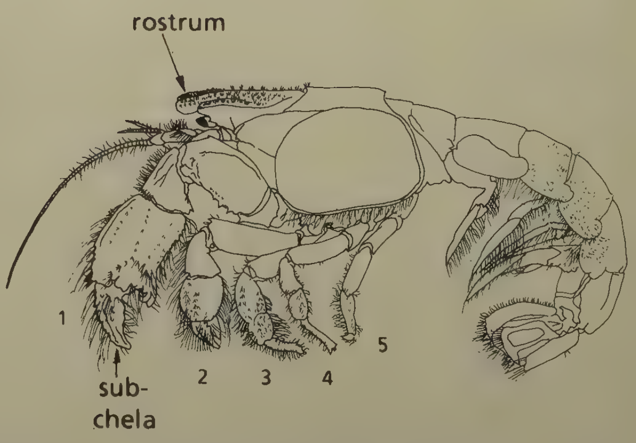
Infraorder **Palinuridea**
Superfamily **Palinuroidea**
Family **Synaxidae**
Fig. 23



Infraorder **Palinuridea**
Superfamily **Glypheoidea**
Family **Glypheidae**
Fig. 21



Infraorder **Palinuridea**
Superfamily **Palinuroidea**
Family **Palinuridae**
Fig. 22



Infraorder **Thalassinidea**
Fig. 24

2.1 INFRAORDER **ASTACIDEA** Latreille, 1802

Astacini Latreille, 1802, Histoire naturelle générale et particulière des Crustacés et des Insectes, 3:32.

This group includes the true lobsters and crayfishes. The Astacidea can be easily distinguished from the other lobsters by the presence of chelae (pincers) on the first three pairs of legs, and by the fact that the first pair is by far the largest and most robust. The last two pairs of legs end in a simple dactylus, except in ***Thaumastocheles,*** where the 5th leg may bear a minute pincer.

The infraorder consists of three superfamilies, two of these, the Astacoidea Latreille, 1802 (crayfishes of the northern Hemisphere) and the Parastacoidea (crayfishes of the southern Hemisphere), include only freshwater species and are not further considered here. The third superfamily, Nephropoidea, comprises the true lobsters, treated below.

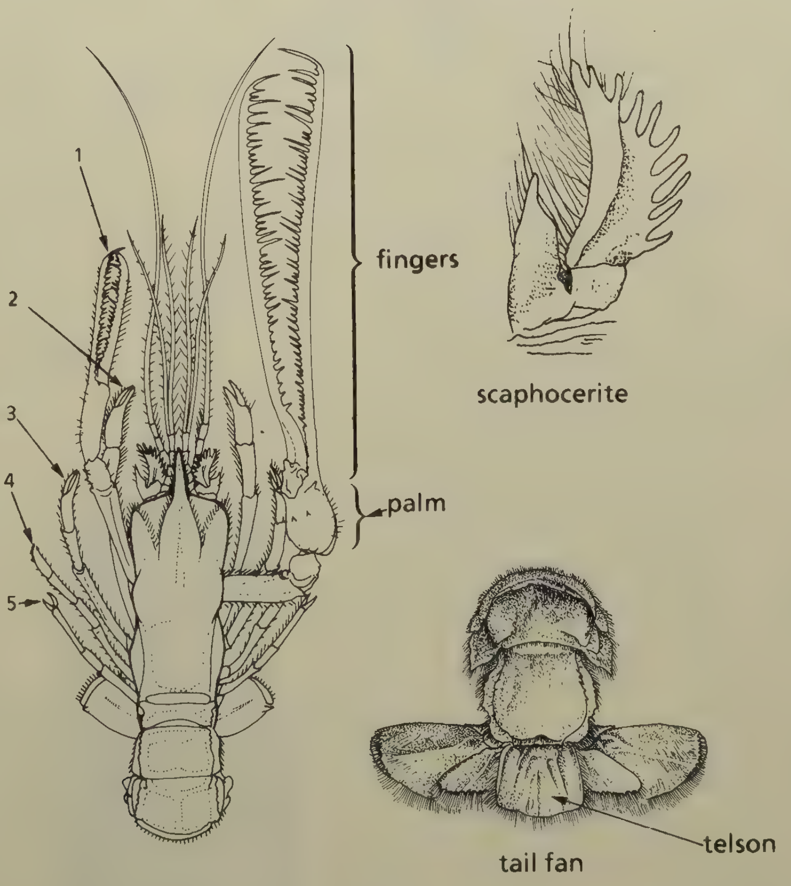
SUPERFAMILY **NEPHROPOIDEA** Dana, 1852

Nephropinae Dana, 1852, Proceedings Academy natural Sciences Philadelphia, 6:15.

The Nephropoidea or true lobsters include two families, Thaumastochelidae and Nephropidae. The Nephropidae are commercially very important, while the Thaumastochelidae include only three species, none of which is of economic interest; they are only listed here for completeness' sake.

Key to the Families and Subfamilies of Nephropoidea

1a. Eyes entirely absent, or strongly reduced, without pigment. Telson unarmed. Chelipeds very unequal, the larger with fingers more than four times as long as the palm; cutting edges of the fingers of the larger cheliped with many slender spines. Fifth pereiopod (at least in the female) with a chela. Abdominal pleura short, quadrangular, lateral margin broad, truncate, not ending in a point. Scaphocerite with several very large teeth on the inner margin (Fig. 25) .... **Thaumastochelidae**



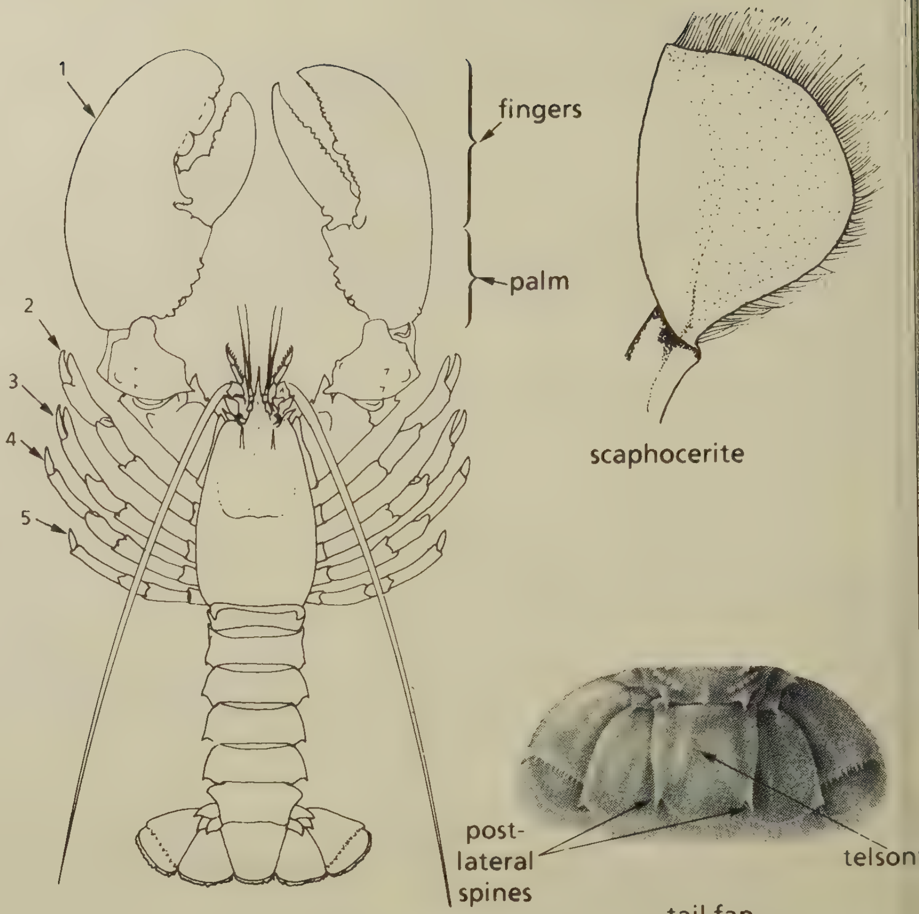
Thaumastochelidae

Fig. 25

1b. Eyes well developed or reduced, always present as movable appendages. Telson with lateral and/or postlateral spines. Chelipeds equal or unequal, but fingers always considerably less than twice as long as palm; teeth on the cutting edge placed in the same plane. Fifth pereiopod without a true chela. Abdominal pleura large, triangular or ovate, usually ending in a point. Scaphocerite, if present, with the inner margin evenly curved, unarmed (Fig. 26) .... **Nephropidae**

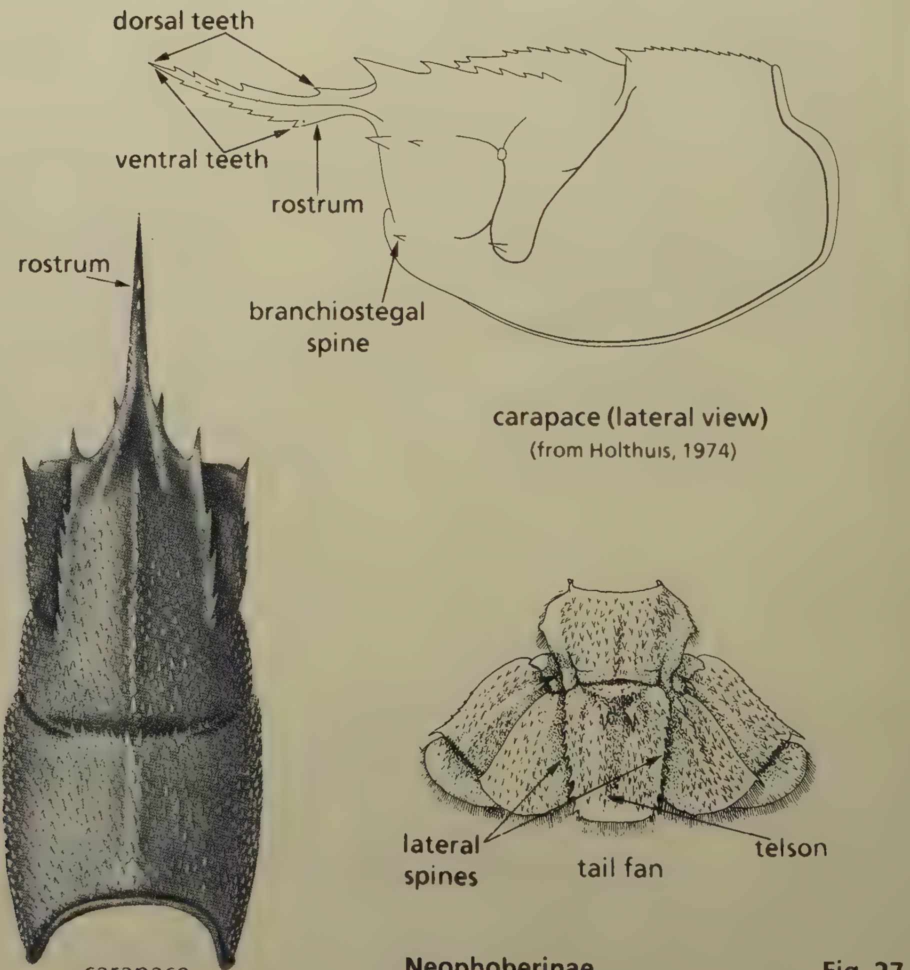
2a. Rostrum laterally compressed for the larger part of its length, with dorsal and ventral, but no lateral teeth. Carapace with branchiostegal spine. Body entirely covered by numerous closely placed and sharply pointed spinules. Lateral margin of the telson with 6 to 12 spines (Fig. 27) .. **Neophoberinae**

2b. Rostrum dorsoventrally depressed with lateral (and sometimes ventral), but without dorsal teeth; sometimes without any teeth. Carapace without a branchiostegal spine. Body never uniformly covered with spinules, although granules may be present all over, or spinules may be placed on the carapace. The lateral margin of the telson with at most three lateral spines, which if present, are usually small and irregular


1
2
3
4
5
fingers
palm
scaphocerite
post-
lateral
spines
telson
tail fan

Nephropidae

Fig. 26


dorsal teeth
ventral teeth
rostrum
branchiostegal
spine
rostrum
lateral
spines
tail fan
telson

carapace (lateral view)
(from Holthuis, 1974)

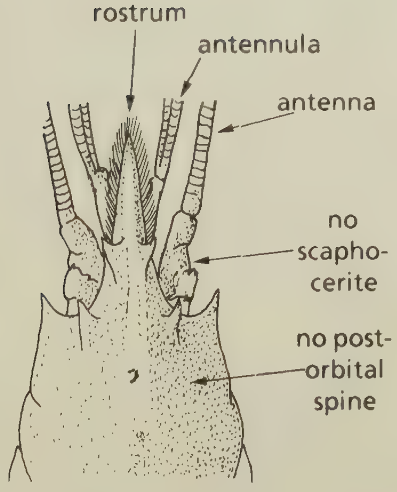
carapace
(dorsal view)
(from Holthuis, 1974)

Neophoberinae

Fig. 27

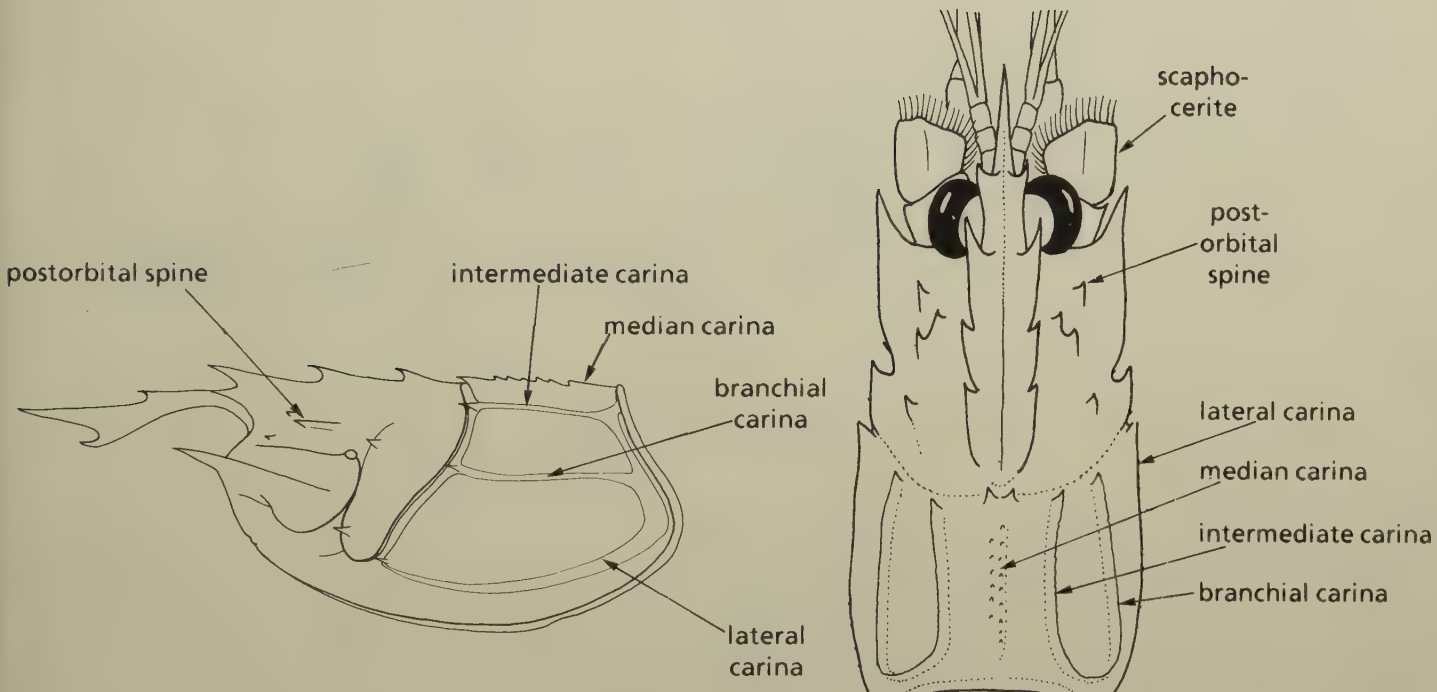
3a. Scaphocerite absent. Carapace without postorbital spine (Fig. 28). Abdominal sternites unarmed in both sexes. No podobranch on second maxilliped .... **Thymopinae**

3b Scaphocerite present. Carapace with a distinct postorbital spine (Fig. 29). Sternites of second to fifth abdominal somites in the male with a sharp median spine each. Podobranch usually present on the second maxilliped .... **Nephropinae**


rostrum
antennula
antenna
no scaphocerite
no postorbital spine

front part of carapace

Thymopinae **Fig. 28**


postorbital spine
intermediate carina
median carina
branchial carina
lateral carina
scaphocerite
postorbital spine
lateral carina
median carina
intermediate carina
branchial carina

carapace (lateral view)

carapace (dorsal view)

Nephropinae **Fig. 29**

2.1.1 FAMILY THAUMASTOCHELIDAE Bate, 1888

Thaumastochelidae Bate, 1888, Report Voyage Challenger, Zool., 24:7,11,46.

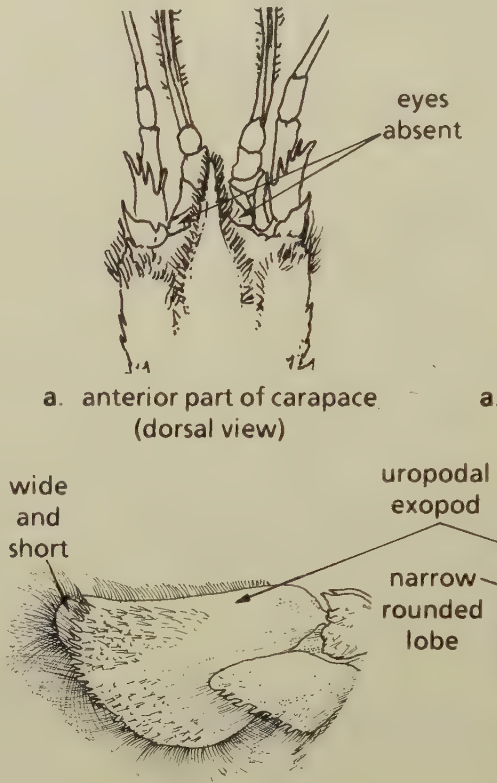
The family is easily recognized by the peculiar shape of the large cheliped with its swollen palm and the very elongate fingers (at least four times as long as the palm) that have very slender, alternating, large and small teeth.

Two genera with a total of three species known so far.

Key to Genera:

1a. Eyes totally absent, eventual remnants immovably fused to the ophthalmic somite (Fig. 30a). Second and third maxillipeds with well developed exopods. Distal part of uropodal exopod behind the diaeresis wide and short (Fig. 30b) .... ***Thaumastocheles***

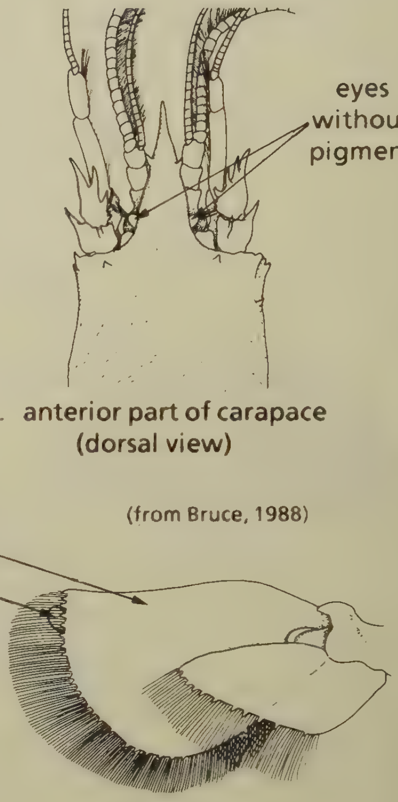
1b. Eyes present, slender and slightly movable, without pigment (Fig. 31a). Exopods of second and third maxillipeds reduced to short scale-like rudiments. Distal part of uropodal exopod, behind diaeresis a narrow rounded lobe (Fig. 31b) .... ***Thaumastochelopsis***



a. anterior part of carapace (dorsal view)

b. uropod

Thaumastocheles Fig. 30



a. anterior part of carapace (dorsal view)

(from Bruce, 1988)

b. uropod

Thaumastochelopsis Fig. 31

Thaumastocheles Wood-Mason, 1874

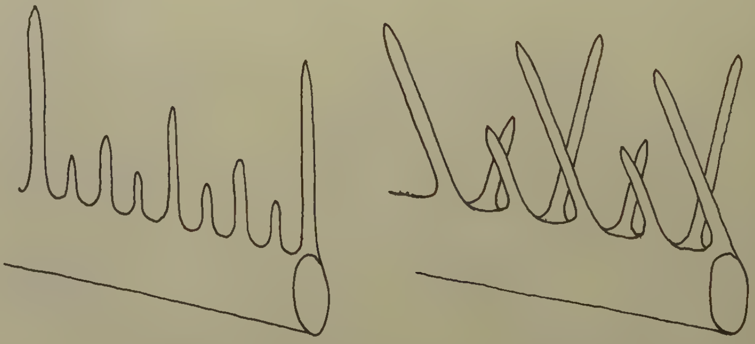
Thaumastocheles Wood-Mason, 1874, Proceedings Asiatic Society Bengal, 1874:181. Gender masculine. Name placed on the Official List of Generic Names in Zoology in Opinion 519 (published in 1958).

Type Species : by monotypy: ***Astacus zaleucus*** Thomson, 1873.

Key to Species:

1a. Teeth on fingers of large cheliped placed in a single row and oriented in the same plane as the fingers themselves (Fig. 32a). Indo-West Pacific .... ***T. japonicus*** (Fig. 33)

1b. The teeth on fingers of large cheliped not in the same plane as the fingers themselves, pointing alternatingly obliquely inward and outward; the bases of the teeth are placed in a single line, but the teeth themselves form two diverging rows (Fig. 32b). Western Atlantic .. ***T. zaleucus*** (Fig. 35)



a. ***T. japonicus*** b. ***T. zaleucus***

Diagram (not drawn to scale) showing arrangement of teeth on finger of large cheliped (after Calman, 1913) Fig. 32

Thaumastocheles japonicus Calman, 1913

Fig. 33

THAU Thau 1

Thaumastocheles japonicus Calman, 1913, Annals Magazine Natural History, (7)12:230.

FAO Names : **En** - Pacific pincer lobster.

Type : Type locality: "Off Yenoshima, Odawara Bay [= off Enoshima near Odawara, Sagami Bay], Japan, 200 fms [= 366 m]" Type specimen in Zoological Museum of University of St. Andrews, Scotland, UK.

Geographical Distribution : East coast of Japan between Sagami and Tosa Bays. A single pincer collected near New Caledonia (22°02'S 165°57'E; 800 m deep) may belong to the present species (Monod, 1973:126, figs 37-39) (Fig. 34).

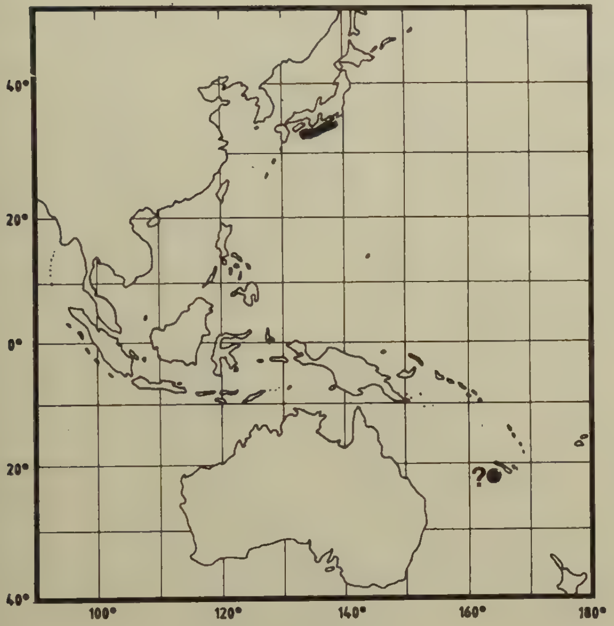
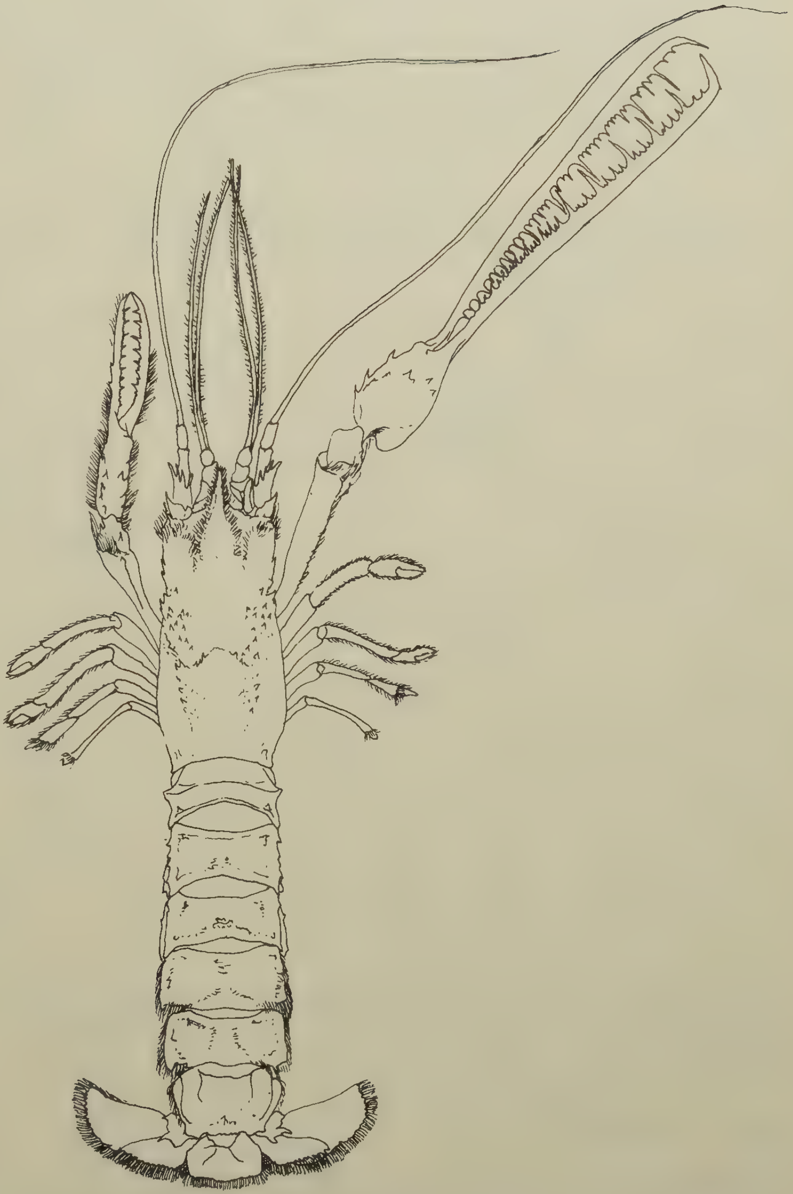


Fig. 34



(after Doflein, 1906)

Fig. 33

Habitat and Biology : The species is known from depths between 366 and 700 m (the New Caledonian specimen from 800 m).

Size : Total length 9 to 17.5 cm, carapace length between 4 and 6 cm.

Interest to Fisheries : None so far. The species is rarely caught, and usually as single specimens. Also the great depths at which it occurs makes it less interesting for commercial exploitation.

Literature : Baba et al., 1986:152, 153, 281, fig. 104.

Thaumastocheles zaleucus (Thomson, 1873)

Fig. 35

THAU Thau 2

Astacus zaleucus Thomson, 1873, Nature, London, 8:246, 247, fig. 1. Specific name placed on Official List of Specific Names in Zoology in Opinion 519 (published in 1958).

FAO Names : En - Atlantic pincer lobster.

Type : Type locality: "Challenger" Station 23, off Sombrero Island, West Indies, 18°24'N 63°28'W, 450 fms [= 823 m], bottom pteropod ooze. Female holotype in BM, No. 88.22 (in alcohol, condition fair); paratype in BM (only fragments).

Geographical Distribution : West Indian region (Straits of Florida, off Yucatan, east of Nicaragua, off Sombrero Island, and off Grenada) (Fig. 36).

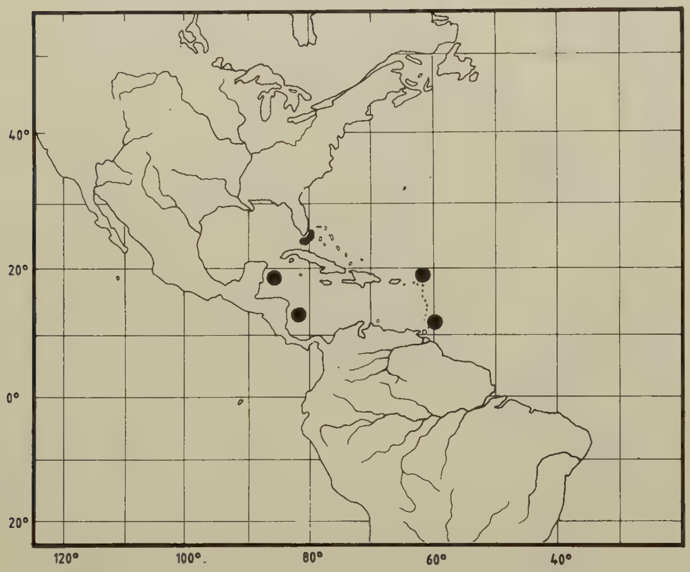


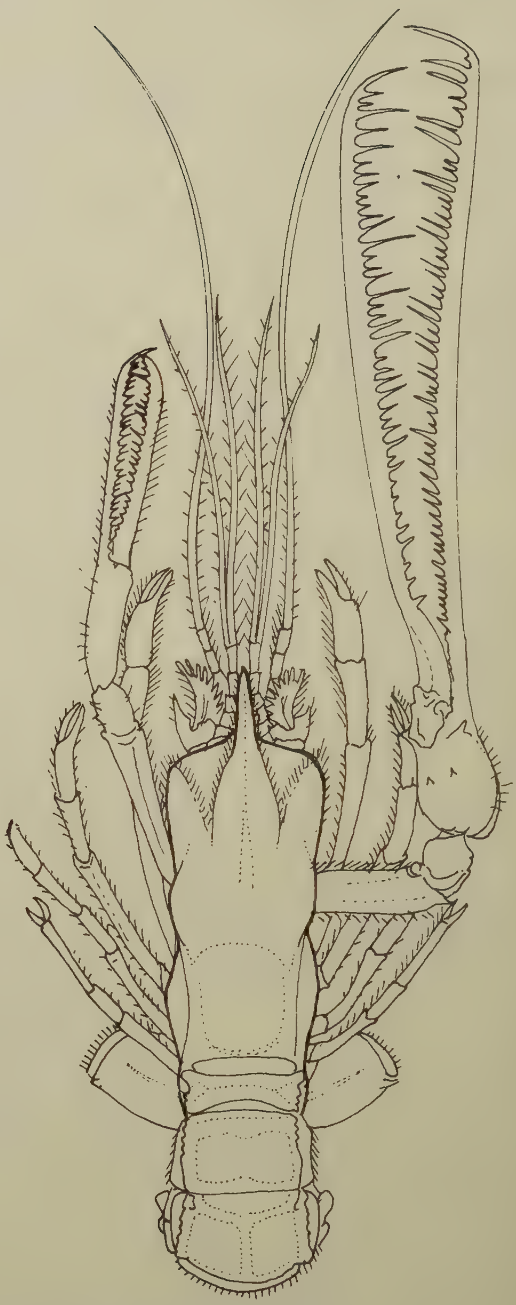
Fig. 36

Habitat and Biology : Deep-sea species from 640 to 1054 m depth. Bottom very flat, of soft mud (ooze). Possibly a burrowing species.

Size : Total length 10 to 16 cm.

Interest to Fisheries : So far none. Only 7 specimens have so far been taken, there are no indications that they ever could be caught in commercially interesting quantities.

Literature : Bate, 1888:47, text fig. 40, pl. 6, pl. 7 fig 1; Holthuis, 1974:729, fig. 1.



(from Bouvier, 1925)

Fig. 35

Thaumastochelopsis Bruce, 1988

THAU Thaup

Thaumastochelopsis Bruce, 1988, Invertebrate Taxonomy, 2:903.

Type Species: by original designation and monotypy: ***Thaumastochelopsis wardi*** Bruce, 1988. Gender feminine.

Genus with a single known species.

Thaumastochelopsis wardi Bruce, 1988

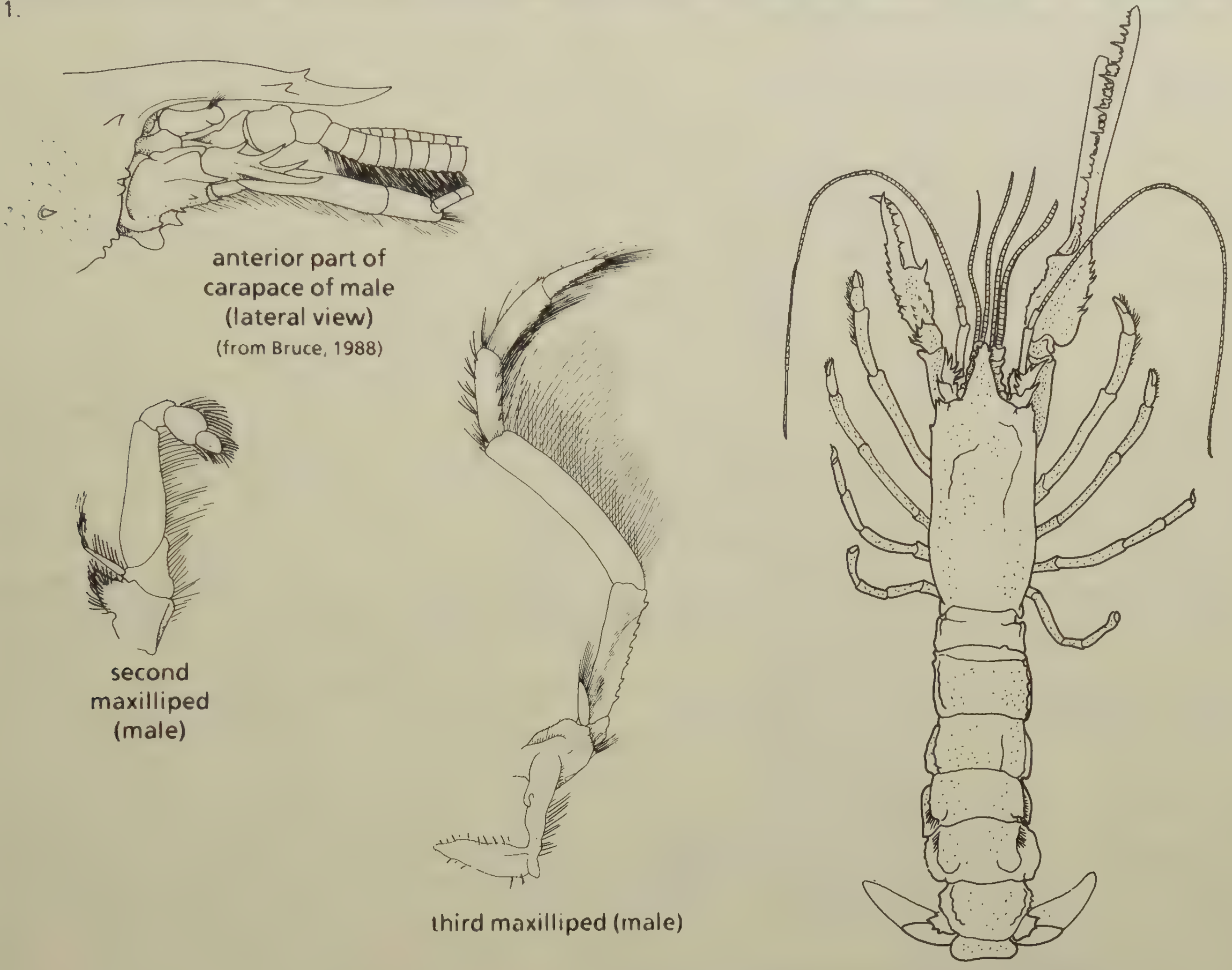
Fig. 37

THAU Thaup 1

Thaumastochelopsis wardi Bruce, 1988, Invertebrate Taxonomy, 2:909, figs 1-7.

FAO Names : En - Australian pincer lobster.

Type : Type locality: "Marian Plateau, off Townsville," Queensland, Australia, "59°05.00'S [error for 19°05.00'S], 149°26.75'E,425 m". Holotype female, and allotype male, Northern Territory Museum, Darwin, Australia, no. Cr. 004231.



anterior part of carapace of male (lateral view) (from Bruce, 1988)

second maxilliped (male)

third maxilliped (male)

(after Bruce, 1988)

dorsal view (female)

Fig. 37

Geographical Distribution : NE Australia (Fig. 38). Only known from the type locality.

Habitat and Biology : Taken at a depth of 425 m.

Size : Total length approximately 7.7 cm (female), 5.7 cm (male); carapace legnth 2.5 cm (female), 1.9 cm (male).

Interest to Fisheries : Inasmuch as only two specimens are known of this species nothing can be stated on this aspect, but it is not likely that the species ever will become of commercial interest.

Literature : Original description.

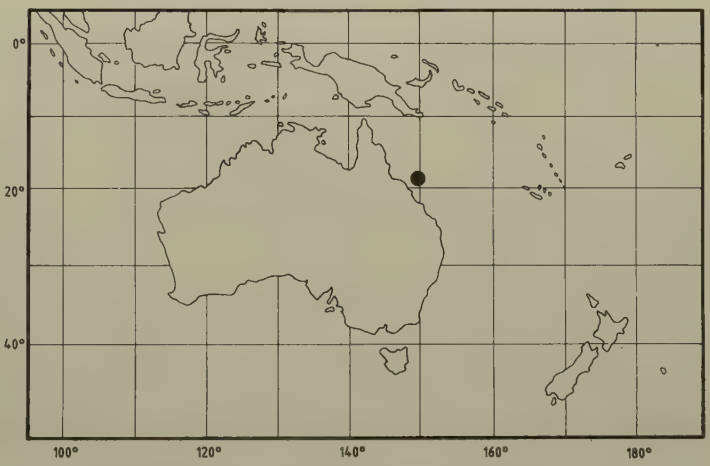


Fig. 38

2.1.2 FAMILY NEPHROPIDAE Dana, 1852

NEPH

Nephropinae Dana, 1852, Proceedings Academy Natural Sciences, Philadelphia,6:15.

Synonyms : Homaridae Huxley, 1879. The grammatically incorrect spelling Nephropsidae has frequently been used for the present family name.

The family Nephropidae is divided into three subfamilies: Neophoberinae, Nephropinae and Thymopinae. A key to these subfamilies is provided on pages 20 and 21.

SUBFAMILY NEOPHOBERINAE Glaessner, 1969

Neophoberinae Glaessner, 1969, in R.C. Moore, Treatise of Invertebrate Paleontology, R(2):459.

Synonyms : Phoberinae Mertin, 1941.

The subfamily contains only a single genus.

Acanthacaris Bate, 1888

NEPH Acant

Acanthacaris Bate, 1888, Report Voyage Challenger, Zool., 24:171, 929, pl. 21. Gender feminine.

Type Species: by monotypy: ***Acanthacaris tenuimana*** Bate, 1888.

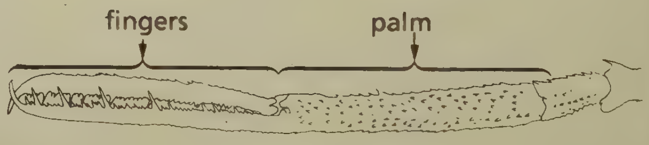
Synonyms : ***Phoberus*** A. Milne Edwards, 1881, Annales Sciences Naturelles, Paris, (Zool.), (6)11(4):1 (not ***Phoberus*** MacLeay, 1818); type species, by monotypy: ***Phoberus caecus*** A. Milne Edwards, 1881; gender masculine.

Neophoberus Glaessner, 1969, in R.C. Moore, Treatise of Invertebrate Paleontology, R(2):460, replacement name for ***Phoberus*** A. Milne Edwards, 1881; gender masculine.

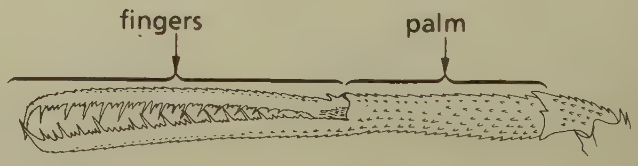
Key to Species:

1a. Fingers of first cheliped about as long as palm (Fig. 39a). Atlantic .... ***A. caeca*** (Fig. 40)

1b. Fingers of first cheliped distinctly longer than palm (Fig. 39b). Indo-West Pacific .... ***A. tenuimana*** (Fig. 42)



a. ***A. caeca***



b. ***A. tenuimana***

Fig. 39

Acanthacaris caeca A. Milne Edwards, 1881

Fig. 40

NEPH Acant 1

Phoberus caecus A. Milne Edwards, 1881, Annales Sciences Naturelles, Paris, (Zool.), (6)11(4):1.

Synonyms : ***Neophoberus caecus*** - Glaessner, 1969.

FAO Names : En - Atlantic deep-sea lobster; **Fr** - Langoustine arganelle; **Sp** - Cigala de fondo.

Type : Type locality: "Blake" Station 264, off Grenada, West Indies, 12°03'15"N 61°48'30"W, 761 m deep, bottom grey ooze. Holotype in MCZ.

Geographical Distribution : Gulf of Mexico, Caribbean Sea, Straits of Florida (Fig. 41).

Habitat and Biology : A deepsea species from 293 to 878 m depth (mostly between 550 and 825 m). Lives on soft mud bottoms in burrows.

Size : Maximum total length 40 cm; carapace length 2 to 17 cm.

Interest to Fisheries : Not actually fished for at present, Exploratory deep-sea trawling showed the species to be present in quantities that might be of commercial interest; also interesting because of its relatively large size.

Local Names: USA: Blind deep sea lobster (Florida).

Literature : Holthuis, 1974:741, fig. 4-8; Fischer (ed.), 1978:vol.6.

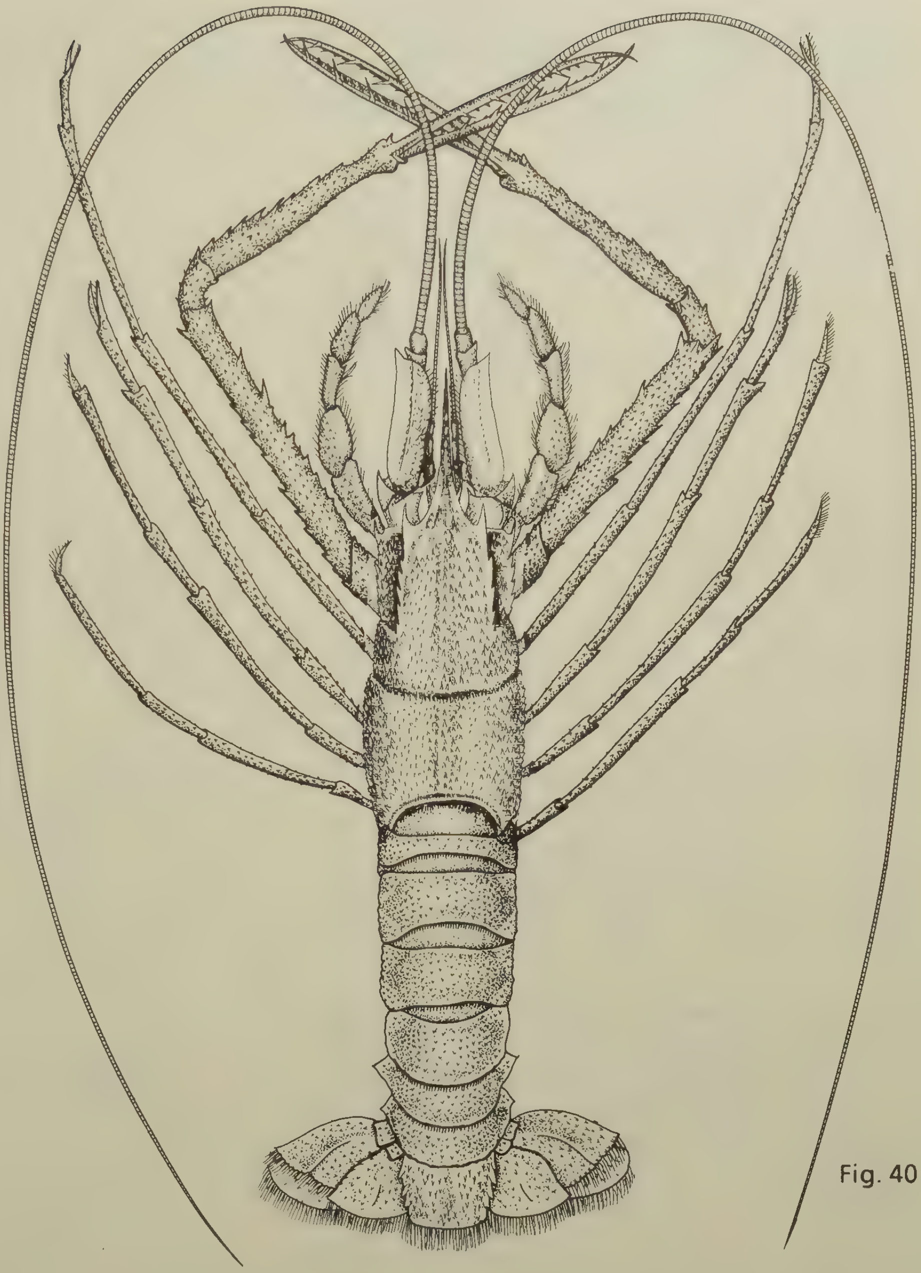


Fig. 40

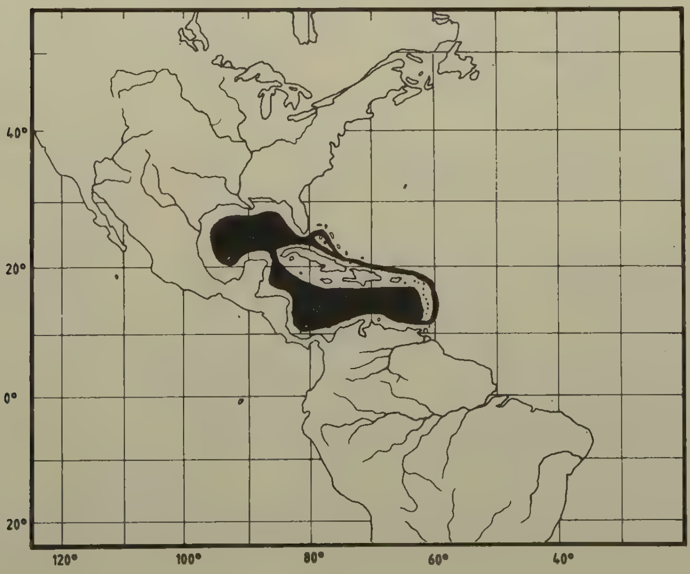


Fig. 41

Acanthacaris tenuimana Bate, 1888

NEPH Acant 2

Acanthacaris tenuimana, Bate, 1888, Report Voyage Challenger, Zool., 24:171, 929, pl. 21.

Synonyms : ***Phoberus tenuimanus*** Bate, 1888; ***Phoberus caecus sublevis*** Wood-Mason & Alcock, 1891; ***Acanthacaris opipara*** Burukovsky & Musy, 1976; ***Phoberus brevirostris*** Thung & Wang, 1985.

FAO Names : **En** - Prickly deep-sea lobster; **Fr** - Langoustine spinuleuse; **Sp** - Cigala raspa.

Type : Type locality of ***Acanthacaris tenuimana***: "Challenger" Station 191, "lat. 5°41'S., long. 134°4'30" E., south of New Guinea; depth, 800 fathoms [= 1463 m]; bottom, green mud". Holotype in BM, no. 88.22 (in alcohol, condition fair).

Type locality of ***Phoberus caecus sublevis***: "Investigator" "Station 105, 740 fathoms" (= "Laccadive Sea, off Goa coast, lat. 15°02'N, long. 72°34'E., 740 fms [= 1353 m]. Grey ooze, coral mud, and 12.5 per cent Foraminifera"). Holotype in ZSI, preserved in alcohol, condition poor.

Type locality of ***Acanthacaris opipara***: "South-west part of the Indian Ocean" near "Durban; 29°57'6"-29°52'5"S., 31°46'2"-31°52'5"E, depth 830-850 m". Depository of holotype unknown.

Type locality of ***Phoberus brevirostris***: " 29°00'-30' N, 127°00'-30'E, 300-900 m deep, East China Sea". Holotype male (no. 81015) and 2 paratype males (nos. 81016 and 81006) in Donghai Fisheries Research Institute, Shanghai, and Biological Department of Hangzhou University, Hangzhou, China.

Geographical Distribution : Indo-West Pacific area (Natal, Mozambique, Madagascar, Laccadive Islands, Japan, Philippines, South China Sea, Indonesia, New Caledonia) (Fig. 43).

Habitat and Biology : Deep sea, from 600 to 1670 m. Muddy bottom.

Size : Maximum known total length 40 cm, carapace length 2-21 cm; ovigerous females, cl. 11-19 cm.

Interest to Fisheries : So far none. The species is taken incidentally in trawls, but so far too rarely and in too small quantities to be of commercial interest. The large size of the specimens might make fishing economically attractive, once the appropriate gear and proper localities where sufficient quantities occur have been found.

Local Names : MOZAMBIQUE: Lagostim espinhoso.

Literature : Fischer & Bianchi (eds), 1984:vol. 5; Macpherson, 1990:293.

Fig. 42

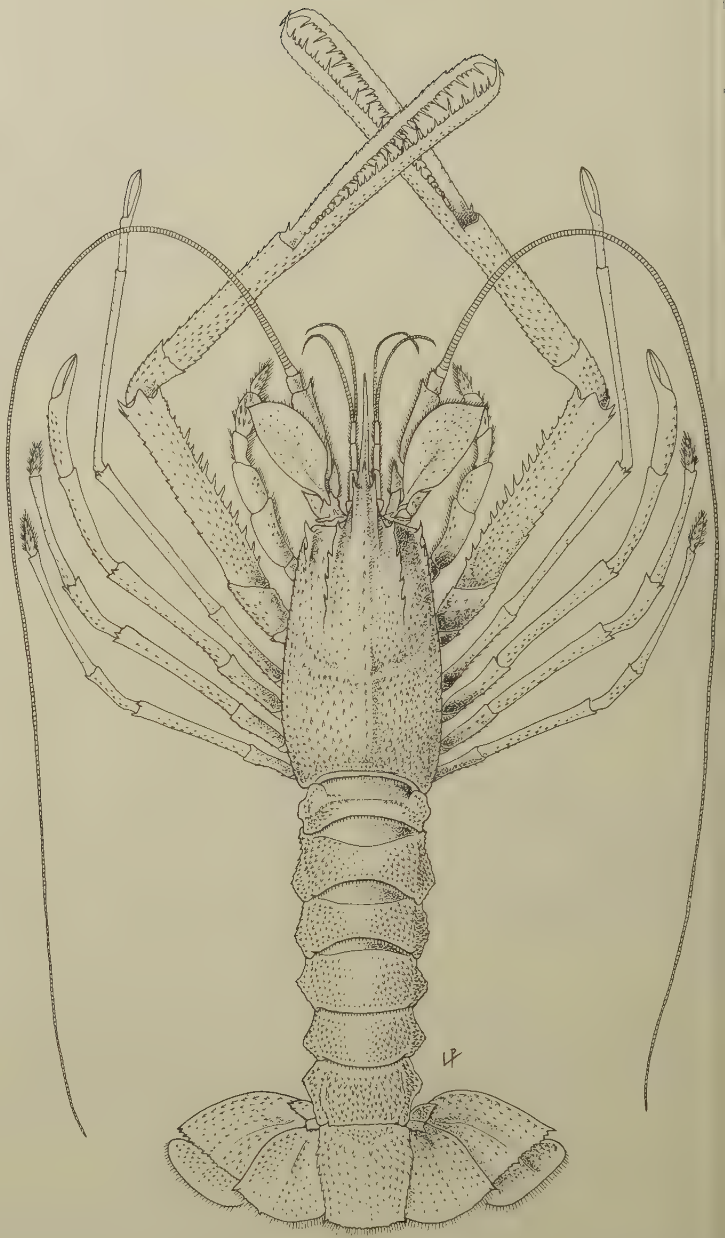


Fig. 42

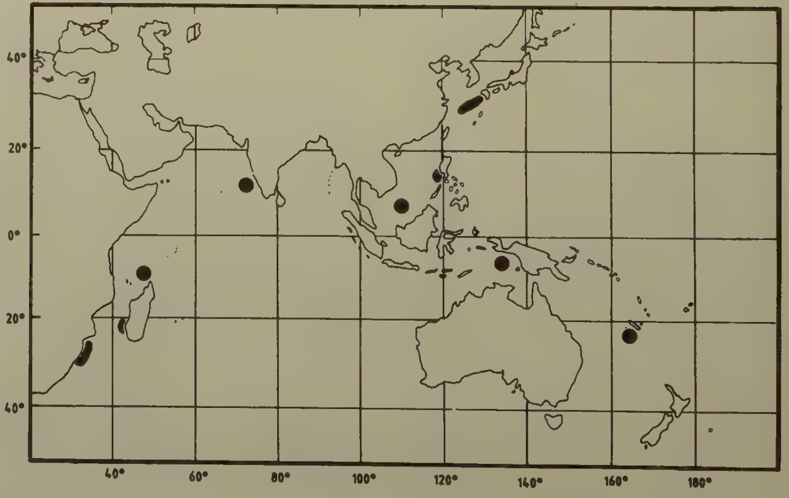


Fig. 43

Remarks : The taxonomy of the species is not clear. It is possible that 2 forms may have to be distinguished: ***A. sublevis*** Wood-Mason, 1891 (with a synonym ***A. opipara*** Burukovsky & Musy, 1976) from the Indian Ocean, and ***A. tenuimana*** s.s from the eastern part of the present range. More material will have to decide this question.

SUBFAMILY **THYMOPINAE** Holthuis, 1974

Thymopinae Holthuis, 1974, Bulletin Marine Science, University Miami, 24(4):753.

This subfamily consists of four genera, viz., ***Nephropides, Nephropsis, Thymops*** and ***Thymopsis.*** Three of these genera include a single species, namely all, except ***Nephropsis***. None of them has any commercial value at present, but some may be of potential interest to fisheries.

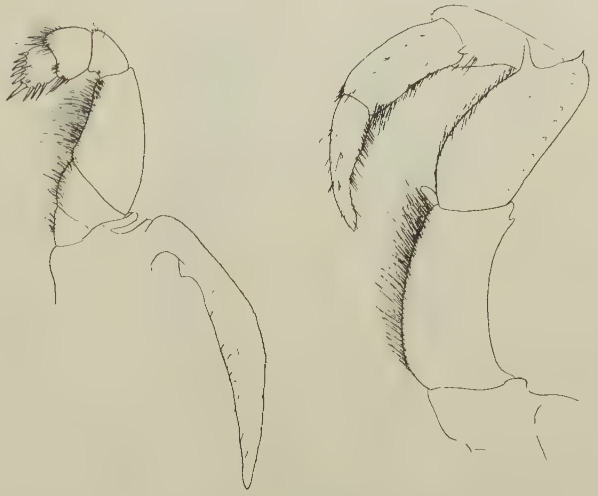
Key to Genera

1a. Second and third maxillipeds without exopods (Fig. 44a). Pleura of second abdominal somite wide and overlapping both the pleura of the first and third somites (Fig. 44b). Lower margin of rostrum with teeth .... ***Thymopsis***

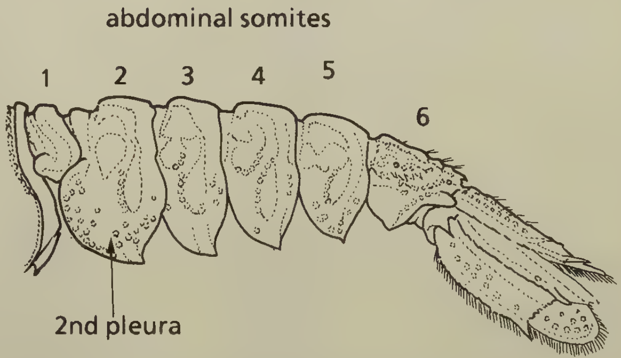
1b. Second and third maxillipeds with exopods (Fig. 45a). Lower margin of rostrum without teeth

  2a. Pleura of abdominal somites broadly overlapping (Fig. 45b). Exopod of second maxilliped without flagellum .... ***Thymops***

  2b. Pleura of abdominal somites narrow, hardly if at all overlapping. Lateral margin of telson unarmed, but for the posterolateral spine. Exopod of second maxilliped with a distinct flagellum

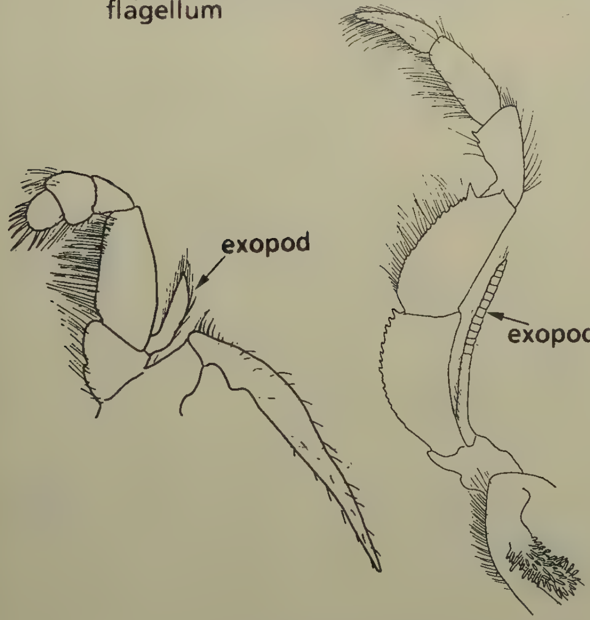


a. second and third maxilliped
(from Holthuis, 1974)

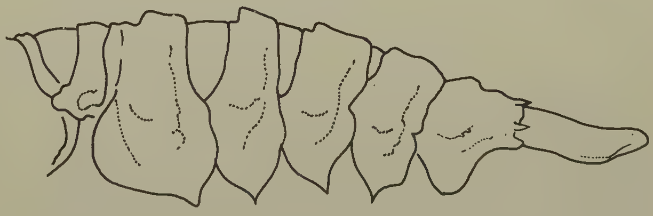


b. abdomen (lateral view)

Thymopsis Fig.44



a. second and third maxilliped
(from Holthuis, 1974)

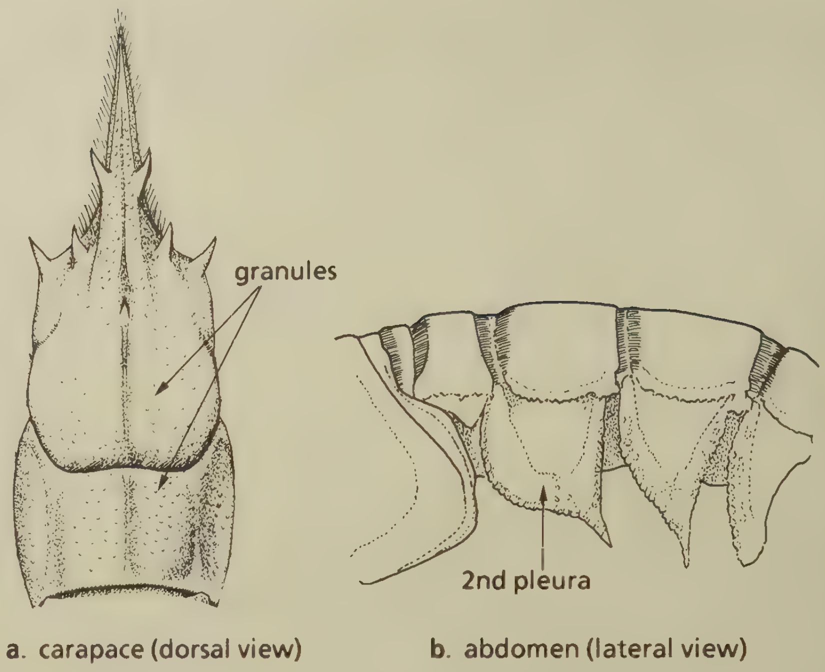


b. abdomen (lateral view)
(after Zarenkov & Semenov, 1972)

Thymops Fig. 45

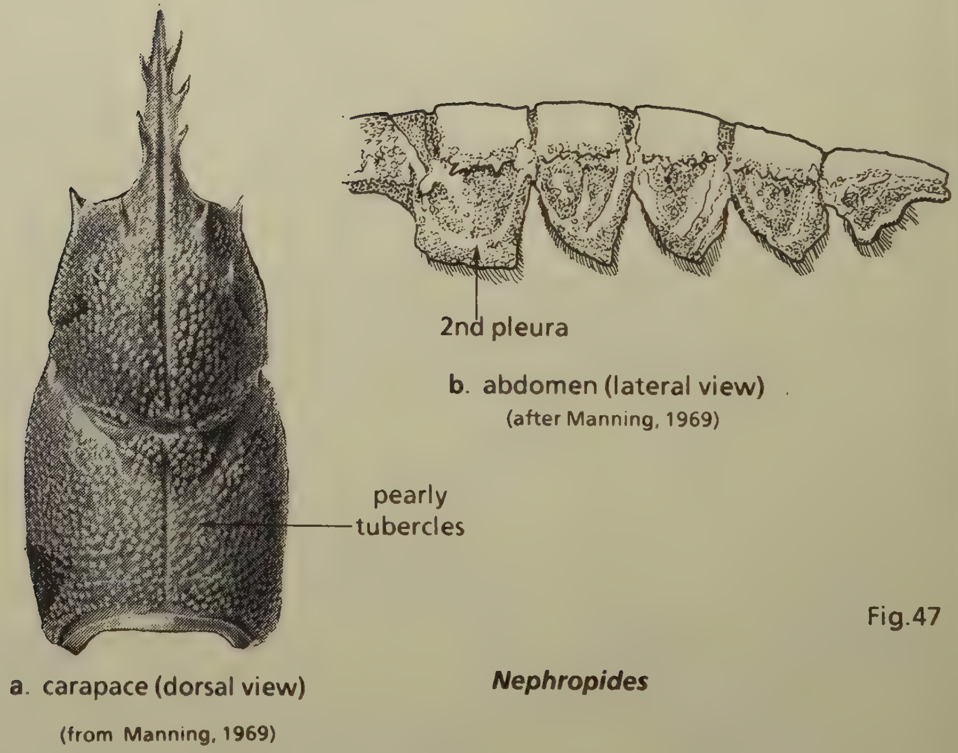
3a. Eye not pigmented. Body granular and hairy, but not covered with evenly placed large pearly tubercles (Fig. 46a). Pleura of second abdominal somite ending in a long sharp point (Fig. 46b) ...... ***Nephropsis***

3b. Eye with pigmented, although small, cornea. Body entirely covered by conspicuous rounded pearly tubercles (Fig. 47a). Pleura of second abdominal somite broadly trapezoid, distal margin obliquely truncate, ending in a blunt posterior tooth (Fig. 47b) .... ***Nephropides***



a. carapace (dorsal view) b. abdomen (lateral view)

Nephropsis Fig.46



b. abdomen (lateral view)
(after Manning, 1969)

a. carapace (dorsal view)
(from Manning, 1969)

Fig.47

Nephropides

Nephropides Manning, 1969

NEPH Nephid

Nephropides Manning, 1969, Crustaceana, 17:303. Gender masculine.

Type Species: by original designation and monotypy: ***Nephropides caribaeus*** Manning, 1969.

A single species known so far.

Nephropides caribaeus Manning, 1969

Fig. 48

NEPH Nephid 1

Nephropides caribaeus Manning, 1969, Crustaceana, 17:304, text-fig.1 pl. 1.

FAO Names : En - Mitten lobsterette.

Type : Type locality: Off Caribbean coast of "Nicaragua, 12°25'N 82°15'W; depth 546-582 m". Holo-type in USNM, no. 113741; paratypes in USNM, RMNH.

Geographical Distribution : Extreme western Caribbean Sea off the coasts of Central America and northern South America, from Belize to Colombia, 16°58' to 9°24'N, 76°31.5' to 87°53'W (Fig. 49).

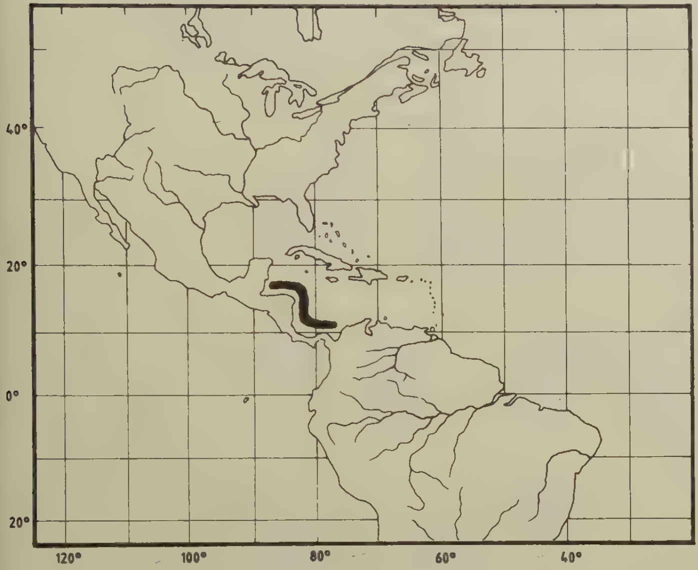


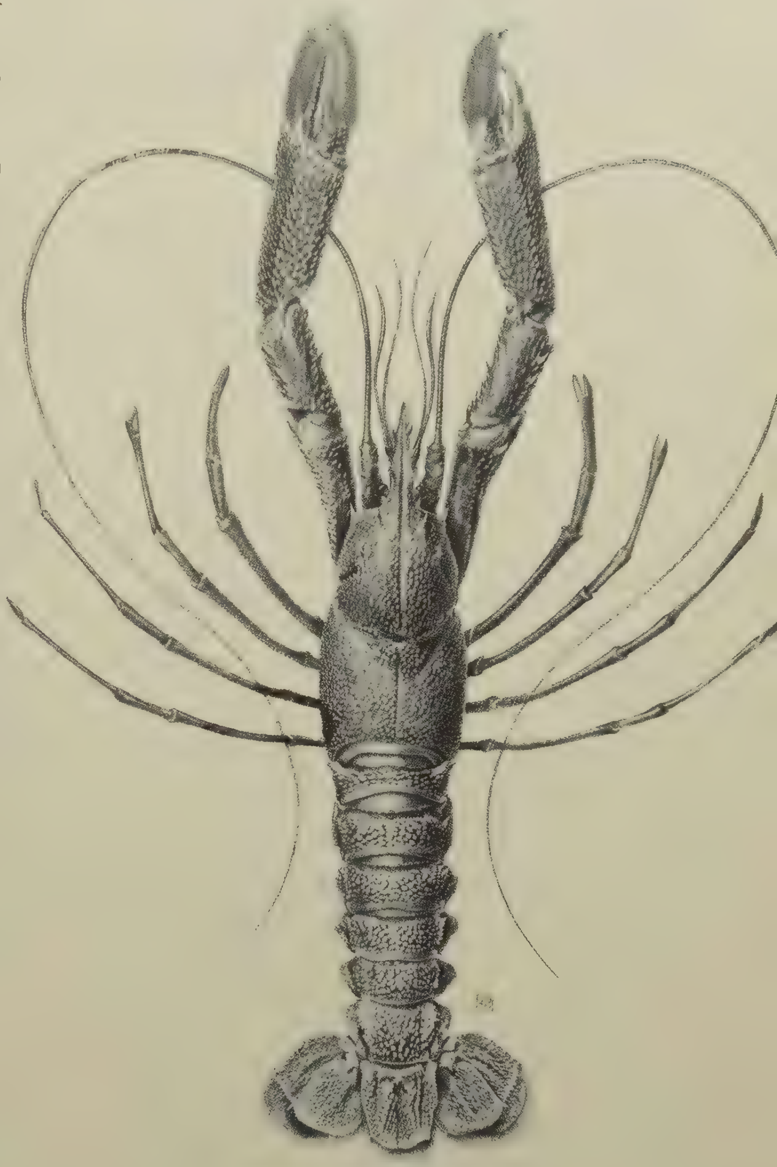
Fig. 49

Habitat and Biology : Deep sea, 511 to 728 m; on mud bottom.

Size : Total length 15.6 to 17 cm, carapace length 5 to 6 cm.

Interest to Fisheries : So far none, but the size of the specimens might make the exploitation profitable if good fishing grounds are found.

Literature : Manning, 1969:304, text-fig. 1 pl. 1; Holthuis, 1974:806-10, figs 22,23.



(from Manning, 1969) Fig. 48

Nephropsis Wood-Mason, 1873

NEPH Nephps

Nephropsis Wood-Mason, 1873, Annals Magazine natural History, (4)12:60. Gender feminine. Name placed on the Official List of Generic Names in Zoology in Opinion 559 (published in 1959).

Type Species : by monotypy : ***Nephropsis stewarti*** Wood-Mason, 1873.

At present, 13 species of the genus ***Nephropsis*** are known, 5 from the Atlantic, 7 from the Indo-West Pacific, and one from the eastern Pacific region. None of these species are currently being fished on a commercial scale, but some are of potential interest.

The taxonomic status of several species is not clear, and therefore the following key to species must be considered as provisional; several new species can be expected.

Key to Species:

1a. Rostrum without lateral teeth. A strong post-supraorbital spine present behind the supraorbital spine (Fig. 50a). Abdominal somites 3 to 6 with a median dorsal carina (Fig. 50b). Anterior margin of pleura of second abdominal somite without spines (Fig. 51a). Telson without medio-dorsal spine (Fig. 52a). Indo-West Pacific .... ***N. ensirostris*** (Fig. 71)

1b. Rostrum with lateral teeth. Other characters mentioned under 1a present or absent

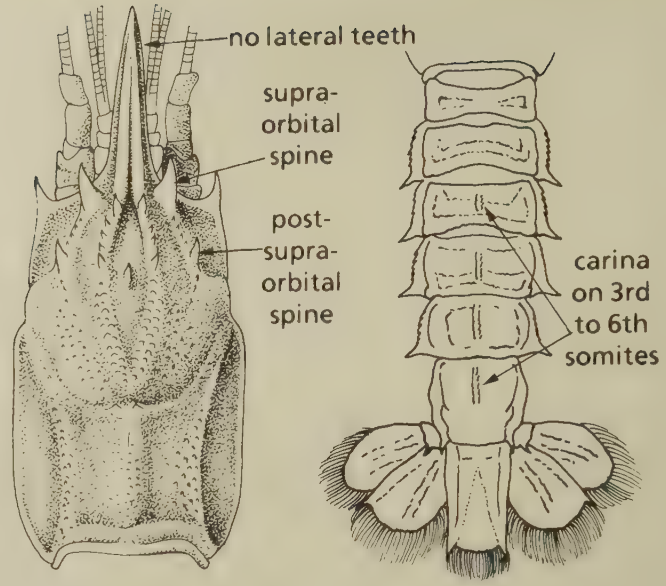
2a Rostrum with one pair of lateral teeth (one tooth on either margin) (Fig. 53). Anterior margin of pleuron of second abdominal somite without a spine, although the pleuron itself may end in a sharp, spine-like tip (Fig. 51a)

3a. An erect dorsal spine placed in the middle of the basal part of the telson (Fig. 52b). Post-supraorbital spine absent or replaced by one or more spinules. Abdominal somites 2 to 6 with a median dorsal carina. Exopod of uropod with a diaeresis (Fig. 60a)

4a. Carapace smooth. Rostrum less than half as long as the rest of the carapace. Anterior margin of pleuron of second abdominal somite strongly convex. Eastern Pacific .... ***N. occidentalis*** (Fig. 76)

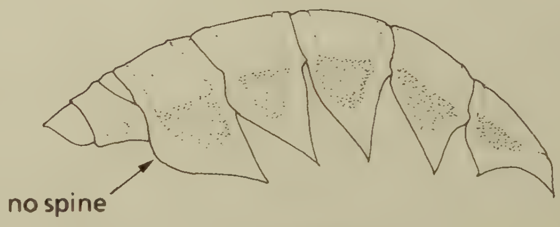
4b. Carapace with numerous small granules. Rostrum more than half as long as the rest of the carapace. Anterior margin of pleuron of second abdominal somite only slightly convex. Indo-West Pacific .... ***N. acanthura*** (Fig. 61)

3b. Telson without an erect dorsal spine on its basal part (Fig. 52a)

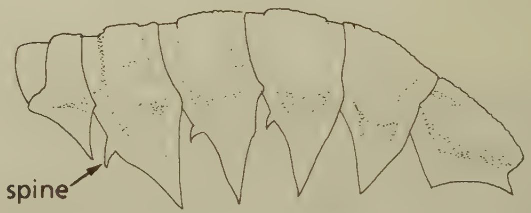


a. carapace (dorsal view) **b.** abdomen (lateral view)

N. ensirostris Fig. 50

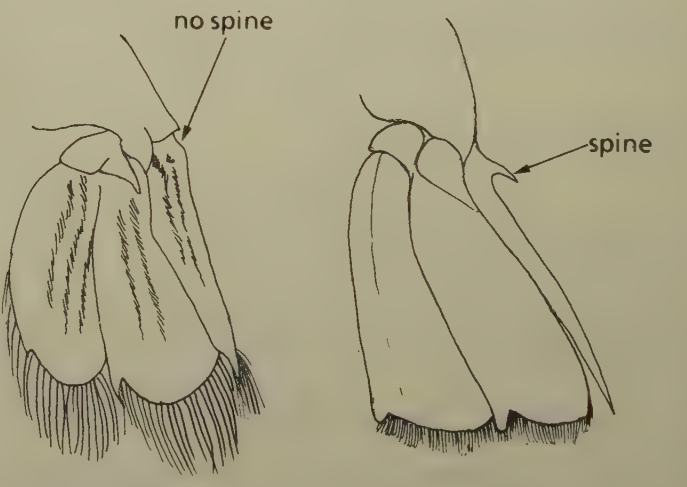


a. ***N. ensirostris***



b ***N. agassizii***

abdomen (lateral view) Fig. 51



a. ***Nephropsis*** sp. **b.** ***N. occidentalis***

tail fan (lateral view) Fig. 52

5a. Abdominal somites without any trace of a mid-dorsal carina. No post supraorbital spine on carapace. The distance between the supraorbital spines and the gastric tubercle is less than half the distance between the gastric tubercle and the cervical groove (Fig. 53). Exopod of uropod with a diaeresis (Fig. 60a). Indo-West Pacific .... ***N. stewarti*** (Fig. 80)

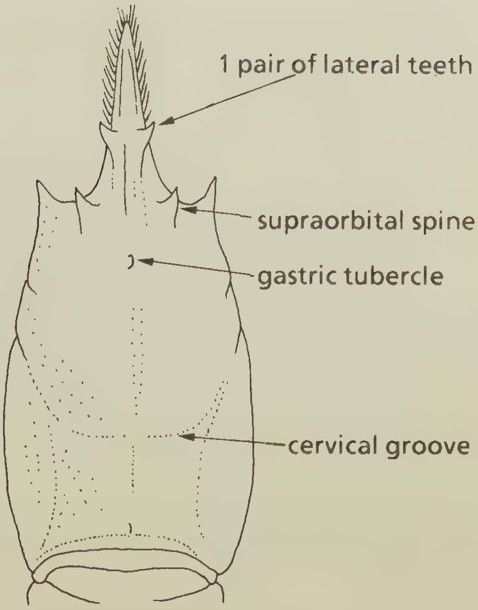
5b. Abdominal somites 2 (or 3) to 6 with a median longitudinal carina

6a. A post supraorbital spinule is present. The distance between the supraorbital spines and the gastric tubercle is about 2/3 of the distance between the gastric tubercle and the cervical groove (Fig. 54). Exopod of uropod with a diaeresis (Fig. 60a). Western Atlantic .. ***N. rosea*** (Fig. 78)

6b. No post supraorbital spinule behind the supraorbital spine. The distance between the supraorbital spines and the gastric tubercle is about half or less than half the distance between the gastric tubercle and the cervical groove (Fig. 55)

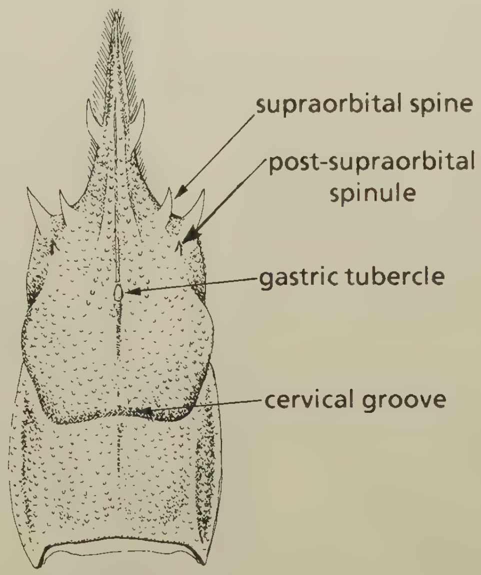
7a. Median dorsal carinae on third to sixth abdominal somites, but not on second (Fig. 56a). Indo-West Pacific .... ***N. carpenteri*** (Fig. 69)

7b. Median dorsal carinae on second to sixth abdominal somites (Fig. 56b). Western Atlantic .... ***N. aculeata*** (Fig. 63)


1 pair of lateral teeth
supraorbital spine
gastric tubercle
cervical groove

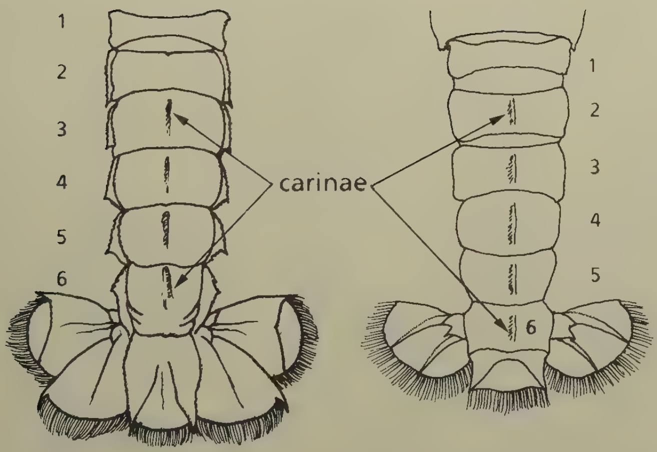
N. stewarti

carapace (dorsal view) Fig. 53


supraorbital spine
post-supraorbital spinule
gastric tubercle
cervical groove

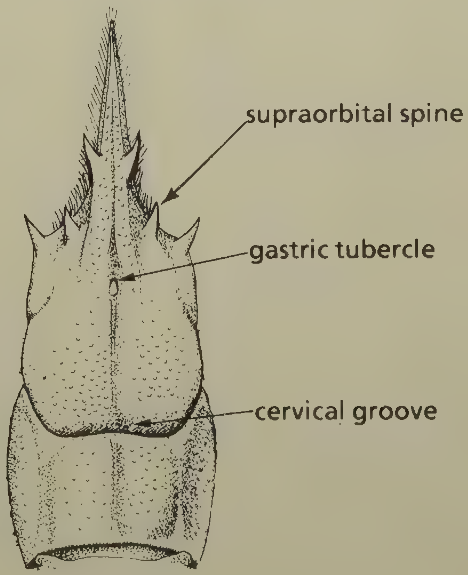
N. rosea

carapace (dorsal view) Fig. 54


1
2
3
4
5
6
carinae
1
2
3
4
5
6

a. ***N. carpenteri*** b. ***N. aculeata***

abdomen (dorsal view) Fig. 56


supraorbital spine
gastric tubercle
cervical groove

N. aculeata

carapace (dorsal view) Fig. 55

2b. Rostrum with two pairs of lateral teeth (Fig. 57a). Anterior margin of second abdominal somite with or without spines

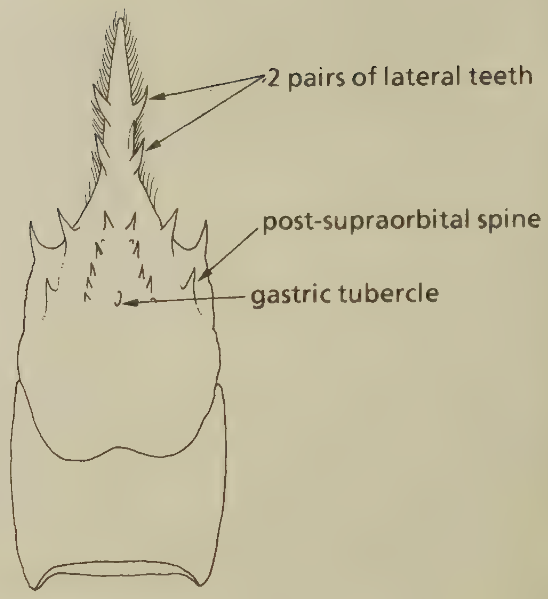
8a. Pleura of second abdominal somite without any spine on the anterior margin (Fig. 57b). A strong post supraorbital spine present on carapace. Gastric tubercle situated slightly behind the post-supraorbital spines (Fig. 57a). A median carina on the second to sixth abdominal somites. Exopod or uropod with a diaeresis (Fig. 60a). Telson without dorsal erect spine in the basal part. Western Atlantic .... ***N. neglecta*** (Fig. 74)

8b. Pleura of second abdominal somite with one or more spines on the anterior margin (Fig. 51b)

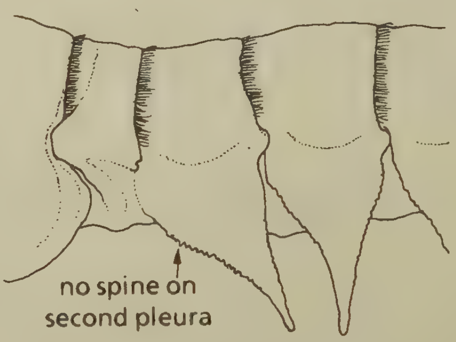
9a. Abdomen with a dorsomedian carina on the second to sixth somites. Exopod of uropod with a diaeresis (Fig. 60a). Rostrum with two pairs of lateral teeth in the basal part. The supraorbital spine is followed by a post supraorbital spine. Anterior margin of pleura of second abdominal somite with one or two spines in the basal half. Telson without mediodorsal spine in the basal part

10a. Median groove of rostrum reaching distinctly beyond anterior pair of lateral rostral teeth. Distance between supraorbital spine and gastric tubercle is half the distance between gastric tubercle and postcervical groove (Fig. 58). Indo-West Pacific .... ***N. sulcata*** (Fig. 84)

10b. Median groove of rostrum failing to reach the anterior pair of lateral rostral teeth. Distance between supraorbital spine and gastric tubercle about two thirds the distance between gastric tubercle and postcervical groove (Fig. 59). Eastern Atlantic .... ***N. atlantica*** (Fig. 67)

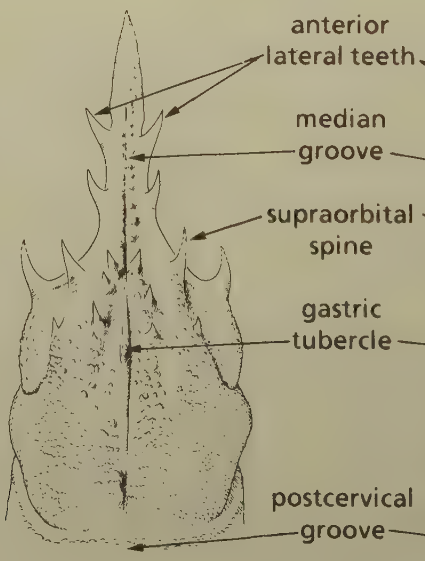


a. carapace (dorsal view)

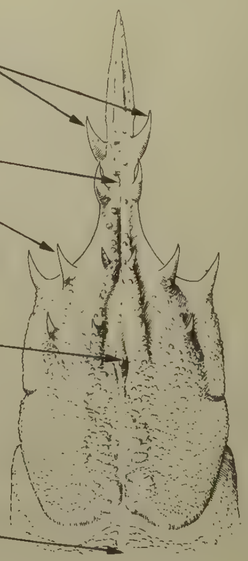


b. abdomen (lateral view)

N. neglecta Fig. 57



anterior part of carapace (dorsal view)
N. sulcata Fig. 58



anterior part of carapace (dorsal view)
N. atlantica Fig. 59

(from Macpherson, 1990)

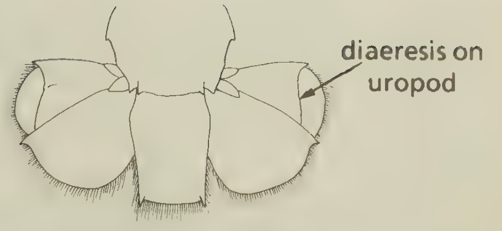
9b. Abdomen without mediodorsal carina

11a. Exopod of uropod with a diaeresis (Fig.60a). Indo-West Pacific .... *N. malhaensis*

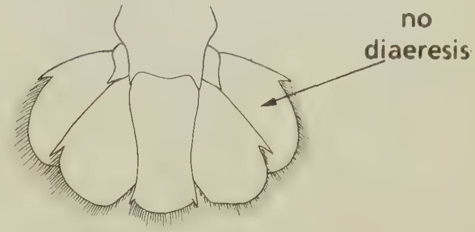
11b. Exopod of uropod without diaeresis (Fig. 60b)

12a. Atlantic species .... *N. agassizii* (Fig. 65)

12b. Indo-West Pacific species .... *N. suhmi* (Fig. 82)



a. ***Nephropsis*** sp.



b. ***N. suhmi***

tail fan

Fig. 60

Nephropsis acanthura Macpherson, 1990

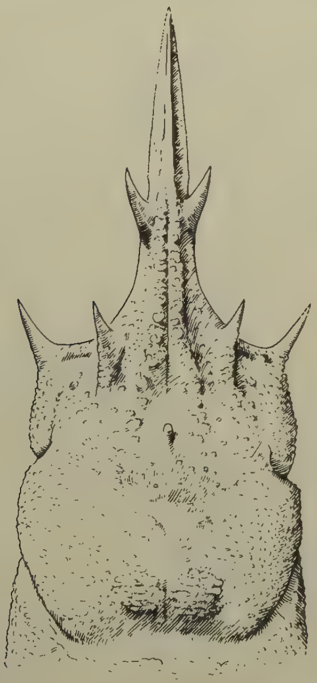
Fig. 61

NEPH Nephps 12

Nephropsis acanthura Macpherson, 1990, Mémoires Muséum National d'Histoire naturelle, Paris, (A) 145:311, figs. 5d, 9d-f, 11a,b, 16d.

FAO Names : **En** - Spinetail lobsterette.

Type : Type locality: Philippines, 13°53.7'N 119°56.3'E, 970 m. Holotype male, MP no AS 546.



anterior part of carapace (dorsal view)
(from Macpherson, 1990)

Fig. 61

Geographical Distribution : Indo-West Pacific region: Madagascar, Philippines, Australia (E. of Queensland), Chesterfield Islands, New Caledonia (Fig. 62).

Habitat and Biology : Deep sea between 850 and 1250 m.

Size : Carapace length, including rostrum: 1.6 to 3 cm (male), 1.5 to 3 cm (female).

Interest to Fisheries : None so far.

Literature : Macpherson, 1990:311-312.

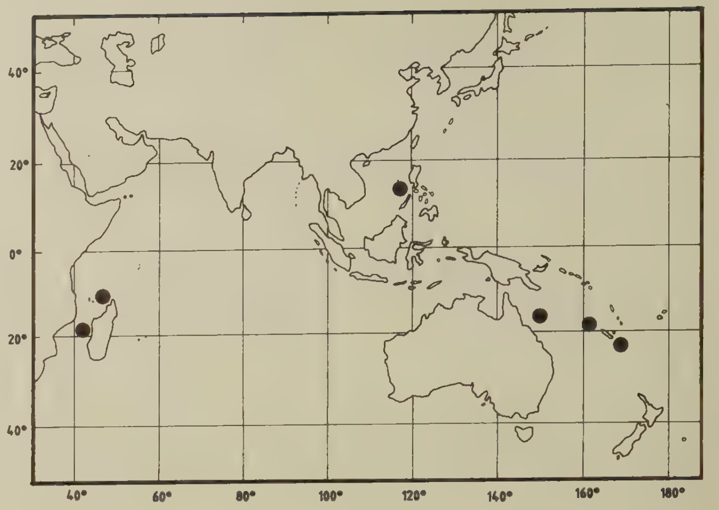


Fig. 62

Nephropsis aculeata S.I. Smith, 1881

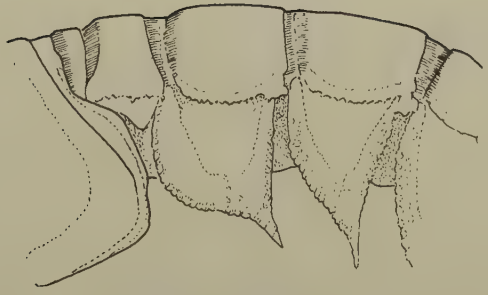
Fig. 63

NEPH Nephps 1

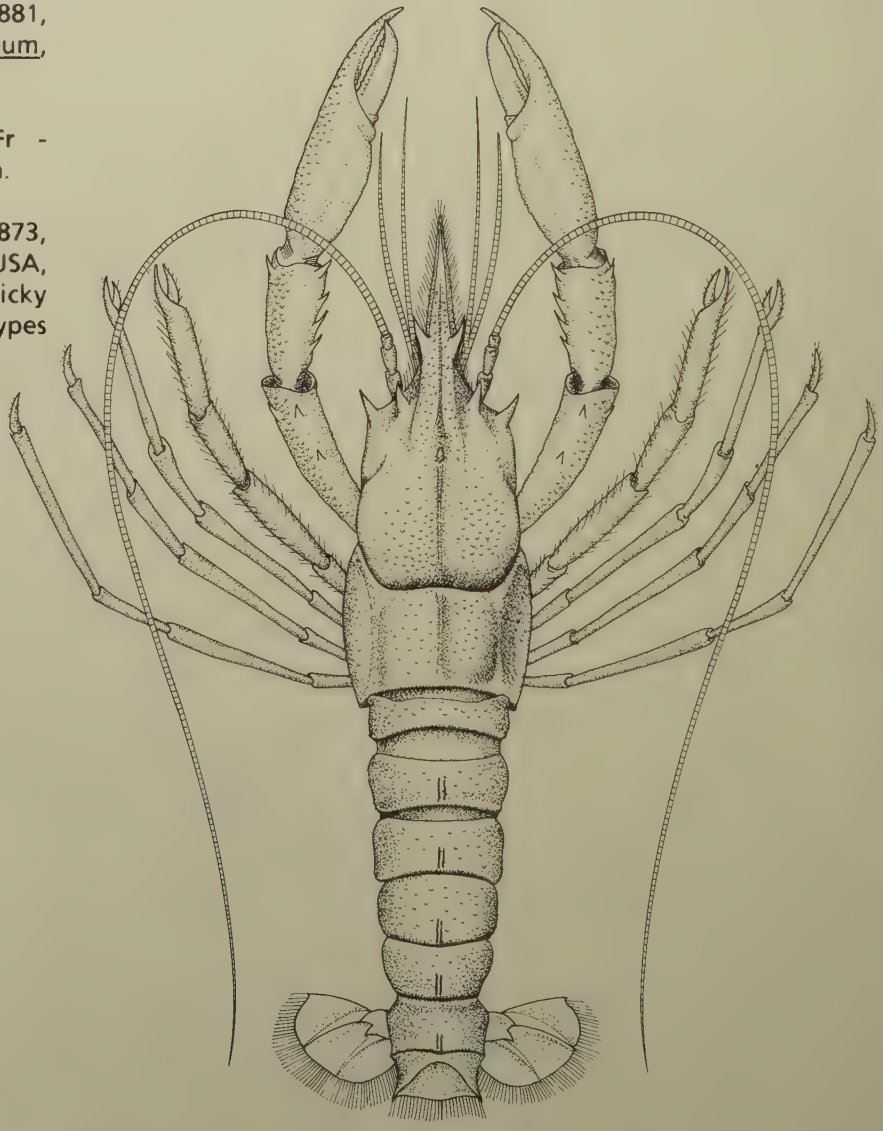
Nephropsis aculeatus S.I. Smith, 1881, Proceedings United States National Museum, 3:431.

FAO Names : **En** - Florida lobsterette; **Fr** - Langoustine de Floride; **Sp** - Cigala de Florida.

Type : Type locality: "Fish Hawk" Station 873, off Martha's Vineyard, Massachusetts, USA, 40°02'N 70°57'W, depth 182 m, bottom soft sticky mud. Lectotype (no. 20923) and 3 paralectotypes in USNM.



abdomen (lateral view)
(after Holthuis, 1974)



dorsal view

Fig. 63

Geographical Distribution : Western Atlantic from off Massachusetts and Bermuda to French Guiana and Suriname, including the entire Gulf of Mexico and Caribbean Sea (Fig. 64).

Habitat and Biology : Deep sea between 137 and 824 m, mostly between 200 and 600 m. Bottom: mud or fine sand.

Size : Maximum total length about 14 5 cm. Carapace length 1.5 to 7 cm.

Interest to Fisheries : Potential. Exploratory fishing in the Gulf of Mexico (off the mouth of the Mississippi, and off East Florida) showed the presence of considerable quantities of the species; with a 65 foot trawl, catches of up to 40 kg/h were obtained.

Literature : Holthuis, 1974:776, figs 15, 16A,B; Fischer (ed.), 1978:vol. 6.

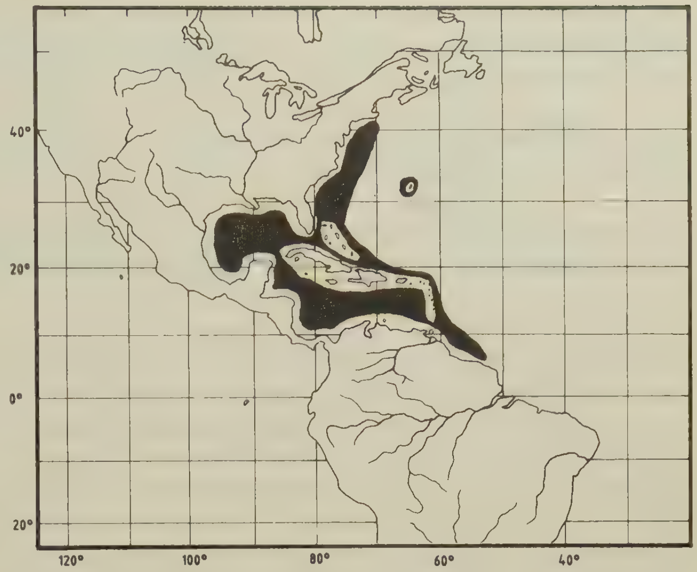


Fig. 64

Nephropsis agassizii A. Milne Edwards, 1880

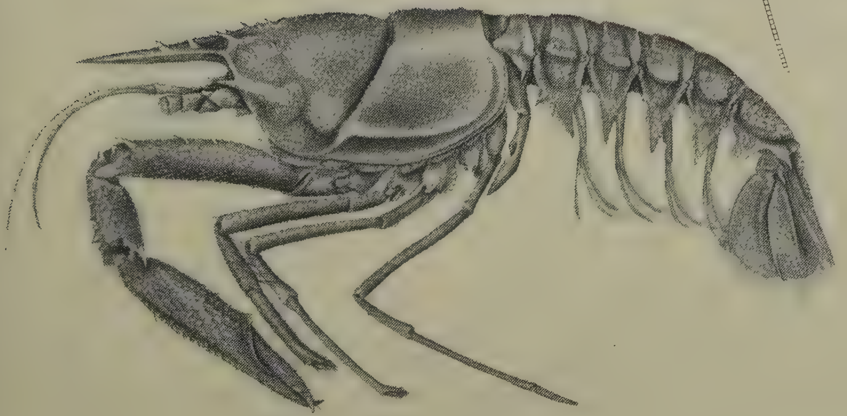
Fig. 65

NEPH Nephps 2

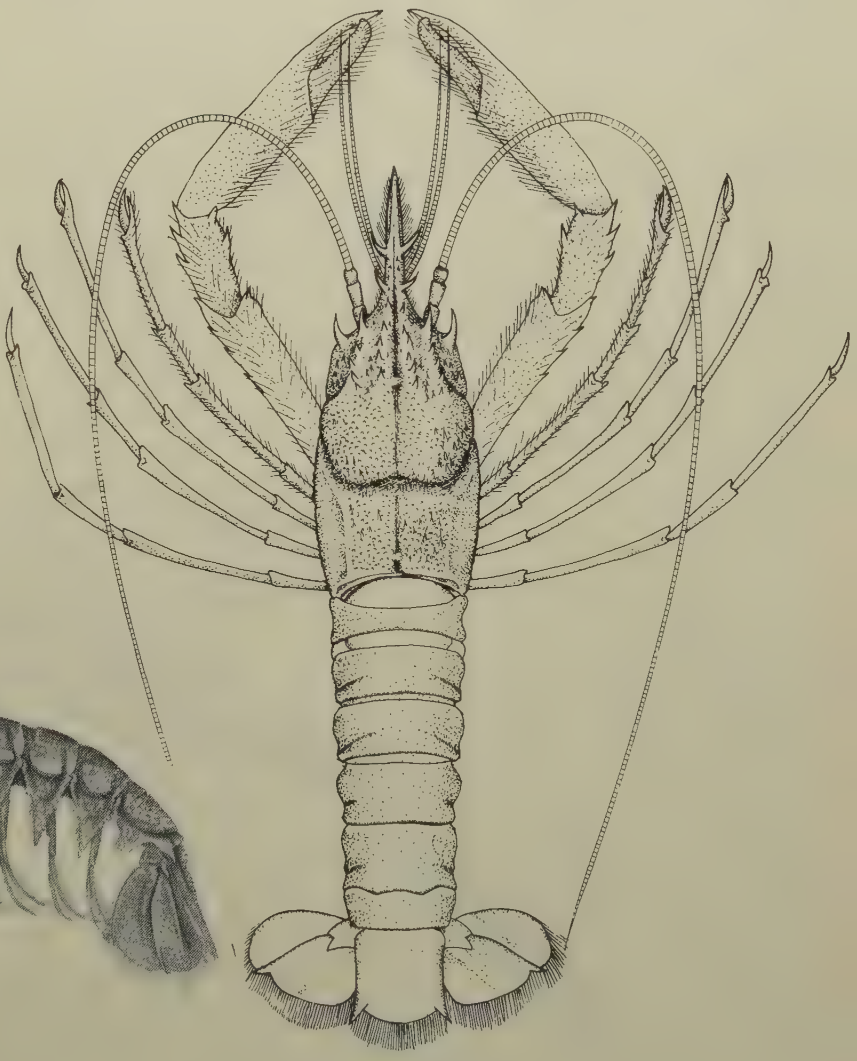
Nephropsis agassizii A. Milne Edwards, 1880, Annales Sciences naturelles, Paris, (Zool.), (6)9(2):1

FAO Names : En - Prickly lobsterette; **Fr** Langoustine épineuse; **Sp** - Cigala de grano.

Type : Type locality: "détroit de Floride, à 1500 mètres de profondeur" cited by A. Milne Edwards (1880) probably is erroneous and should be "Blake" Station 33, north of Yucatan Bank, 24°01'N 88°58'W, 2560-2870 m (see Holthuis, 1974:799-800). Whereabouts of type specimen unknown.



(from Holthuis, 1974) lateral view



dorsal view

Fig. 65

Geographical Distribution : Western Atlantic: Bahama Islands, Gulf of Mexico, Caribbean Sea, Tobago and off São Paulo, Brazil (Fig. 66).

Habitat and Biology : Deep sea between 878 and 2560 m, most common between 1100 and 1900 m.

Size : Maximum total length about 12 cm (carapace length 5.6 cm); adults with carapace length usually between 4 and 5 cm.

Interest to Fisheries : Hardly potential. The species is taken occasionally during exploratory trawling, but never in great quantities. This, plus the fact that the species is relatively small and lives at very great depths make it unlikely that it ever will form the subject of a fishery.

Local Names: USA: Agassiz's lobsterette.

Literature : Holthuis, 1974:796, figs 19,20; Fischer, (ed.), 1978:vol. 6.

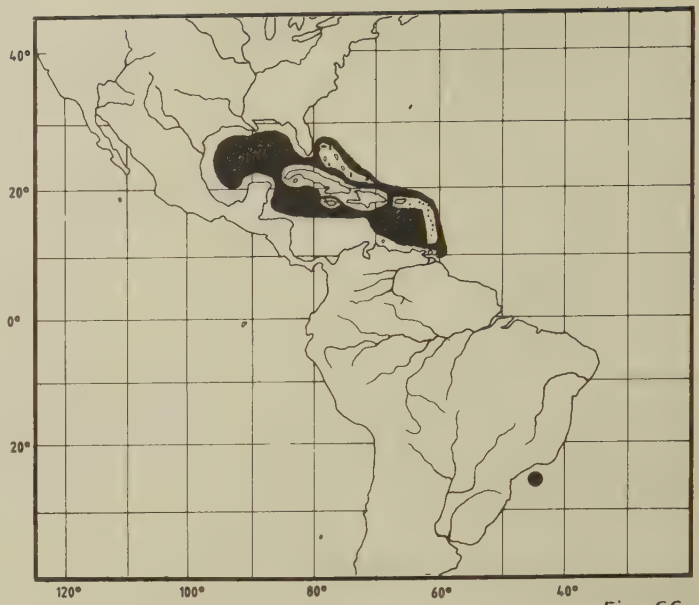


Fig. 66

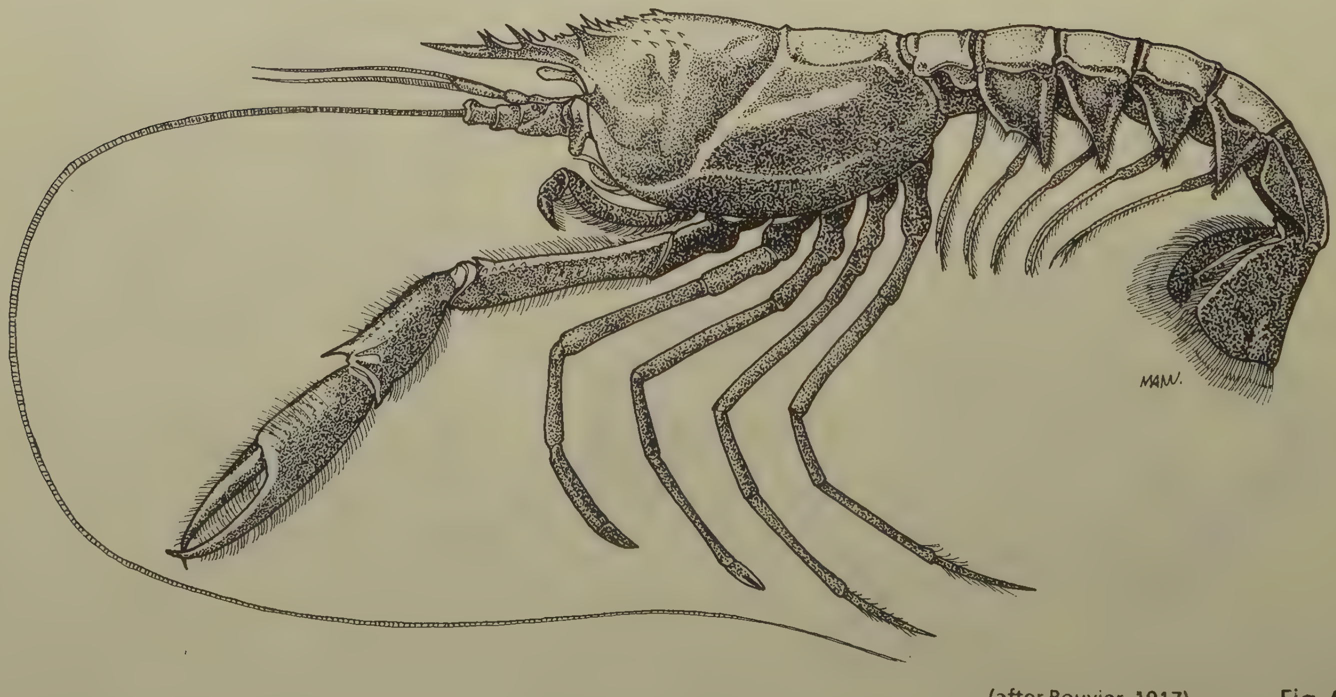
Nephropsis atlantica Norman, 1882

Fig. 67

NEPH Nephps 4

Nephropsis atlantica Norman, 1882, Proceedings Royal Society Edinburgh, 11:684.

FAO Names : **En** - Scarlet lobsterette.



(after Bouvier, 1917) Fig. 67a

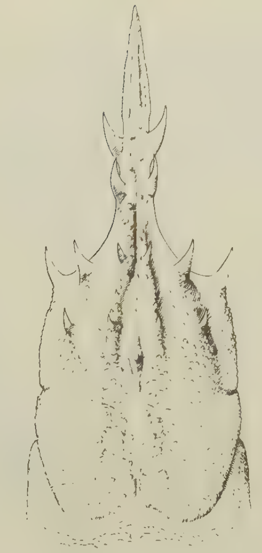
Type : Type locality: ""Knight Errant" August 10, 1880. Station 4; in 555 fathoms (Norman, 1882). Norman evidently made an error in the station number, as the date and depth given by him are those of Station 30 and not Station 4. The position of Station 30 in the Faeroe Channel is 59°33'N 7°14'W, 555 fms = 1015 m, bottom mud. Whereabouts of type unknown, not in BM.

Geographical Distribution : Eastern Atlantic between 61°N and 24°S (Faeroe Islands to Namibia) (Fig. 68). Records of the species from the Indo-West Pacific region refer most probably to ***N. sulcata***.

Habitat and Biology : Deep sea from 470 to 1804 m, mostly between 900 and 1400 m; bottom mud.

Size : Maximum total length 10.3 cm; ovigerous females are 8 to 10 cm long.

Interest to Fisheries : Only potential. The fact that the species is rather small and inhabits great depths makes its suitability for a fishery unlikely, although sometimes it is taken in numbers (RV J.E. PILLSBURY took respectively 16 and 31 specimens at a single station off respectively the Ivory Coast and Liberia).



anterior part of carapace (dorsal view) Fig. 67b
(from Macpherson, 1990)

Literature : Selbie, 1914:48, pl. 7 figs 1-13; Holthuis, 1974:801, fig. 21.

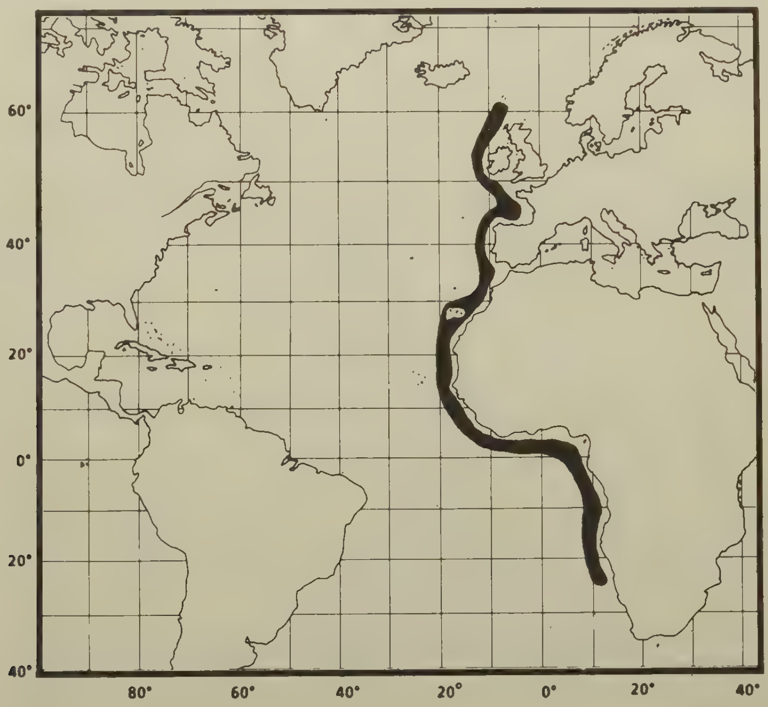


Fig. 68

Nephropsis carpenteri Wood-Mason, 1885

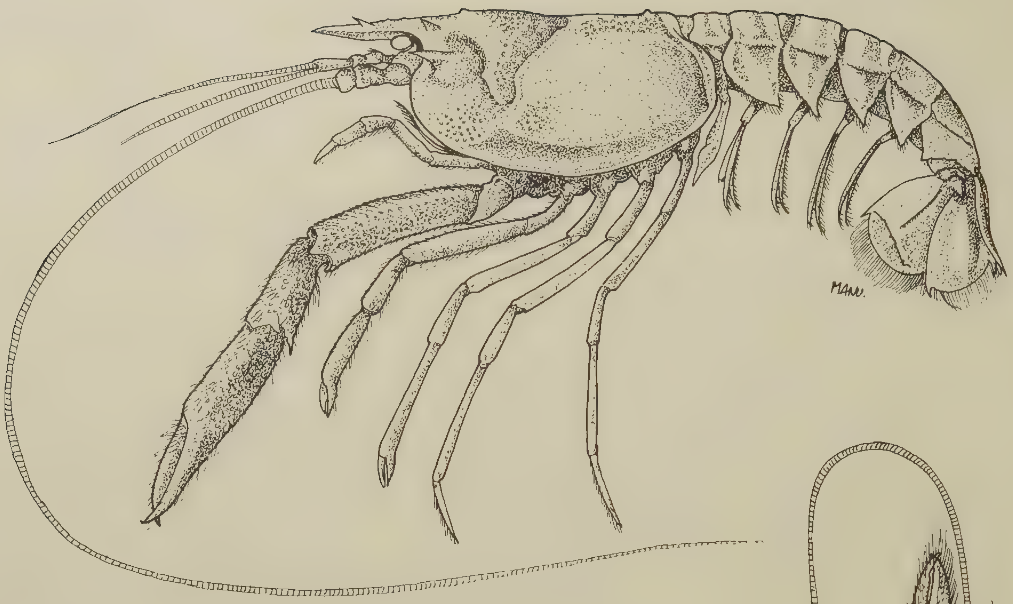
Fig. 69

NEPH Nephps 5

Nephropsis carpenteri Wood-Mason, 1885, Proceedings Asiatic Society Bengal, 1885:71.

FAO Names : En - Ridge-back lobsterette.

Type : Type locality: "Investigator" Station 162. Bay of Bengal, 13°51'12"N 80°28'12"E, 145-250 fms [= 265-457m], brown mud. Holotype in ZSI, no. 4251/7, in alcohol, condition poor.



Geographical Distribution : Indo-West Pacific region: Arabian Sea, Bay of Bengal, Japan (Fig. 70).

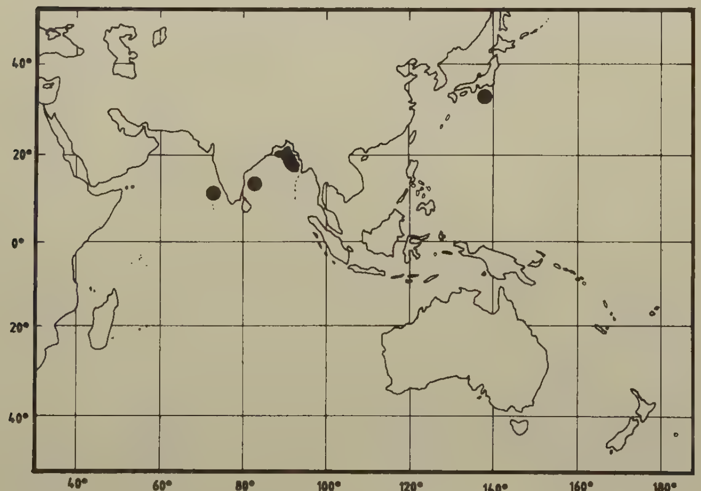
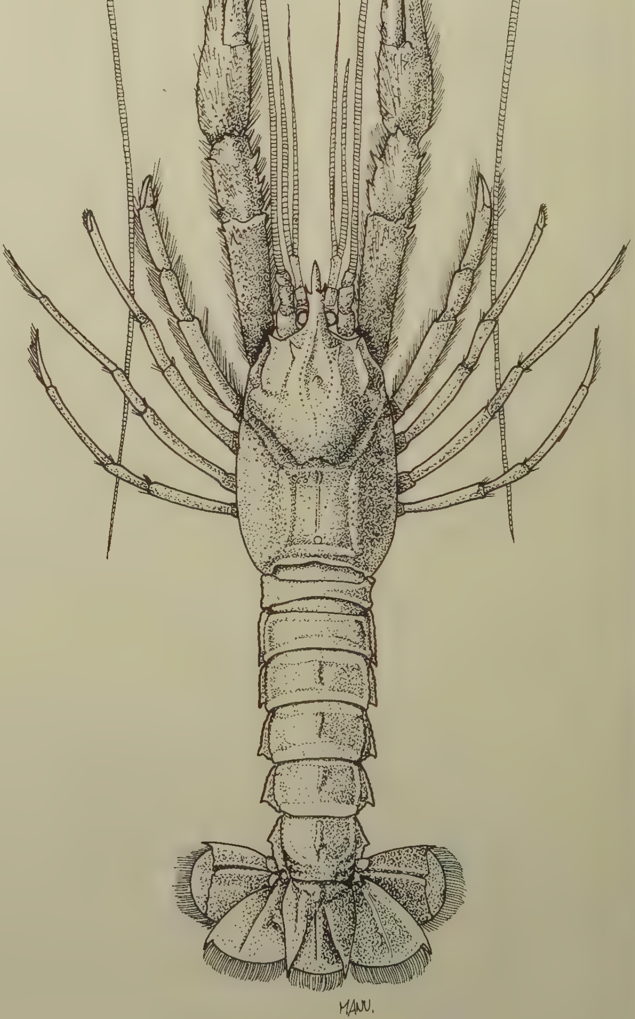


Fig. 70



(after Alcock & Anderson, 1896) Fig. 69

Habitat and Biology : Depth range between 200 and 500 m.

Size : Total length 9 to 12 cm.

Interest to Fisheries : So far none. There are as yet no indications of fishing grounds with a sizeable population of this species.

Literature : Alcock & Anderson, 1896, pl. 27, fig. 2; Alcock, 1901:160; Macpherson, 1990:316, figs 5f, 11e,f,12, 16f.

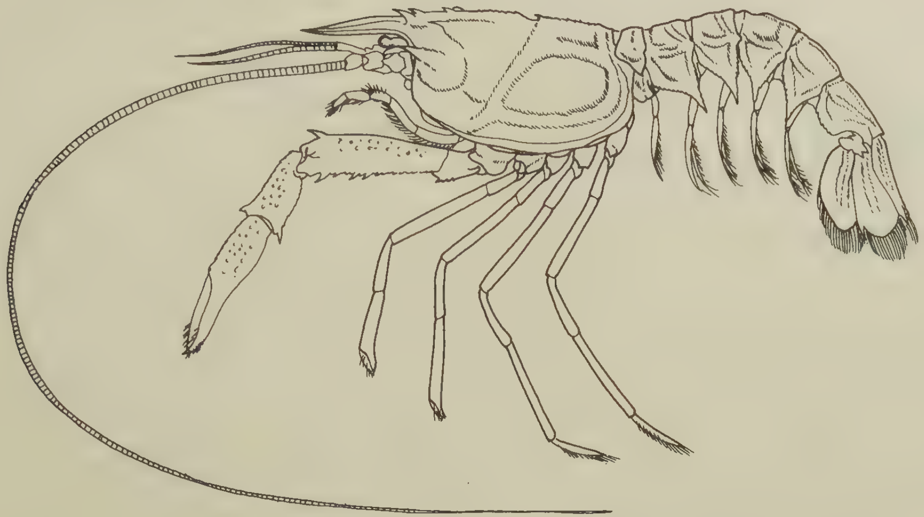
Nephropsis ensirostris Alcock, 1901

Fig. 71

NEPH Nephps 6

Nephropsis ensirostris Alcock, 1901, Descriptive catalogue of Indian deep-sea Crustacea Macrura and Anomala: 162, pl. 1 fig. 2.

FAO Names : En - Gladiator lobsterette.



Type : Type locality: "Investigator" Station 177, "Arabian Sea, north of the Laccadives 636 fathoms" [= 13°47'49"N 73°7'E, 1163 m, green mud]. Type material, ZSI, no. 3892/10; 2 specimens preserved in alcohol, condition poor, probably are types.

Geographical Distribution : Indo-West Pacific region: Gulf of Aden, Arabian Sea, Bay of Bengal, Andaman Sea, Philippines and Indonesia (Fig. 72).

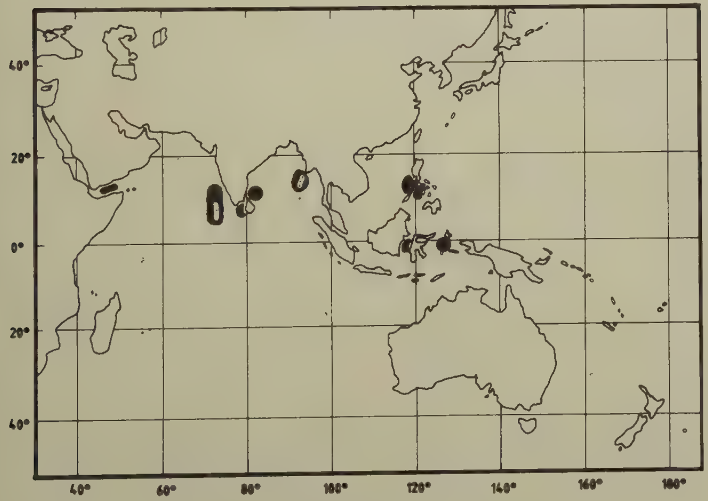
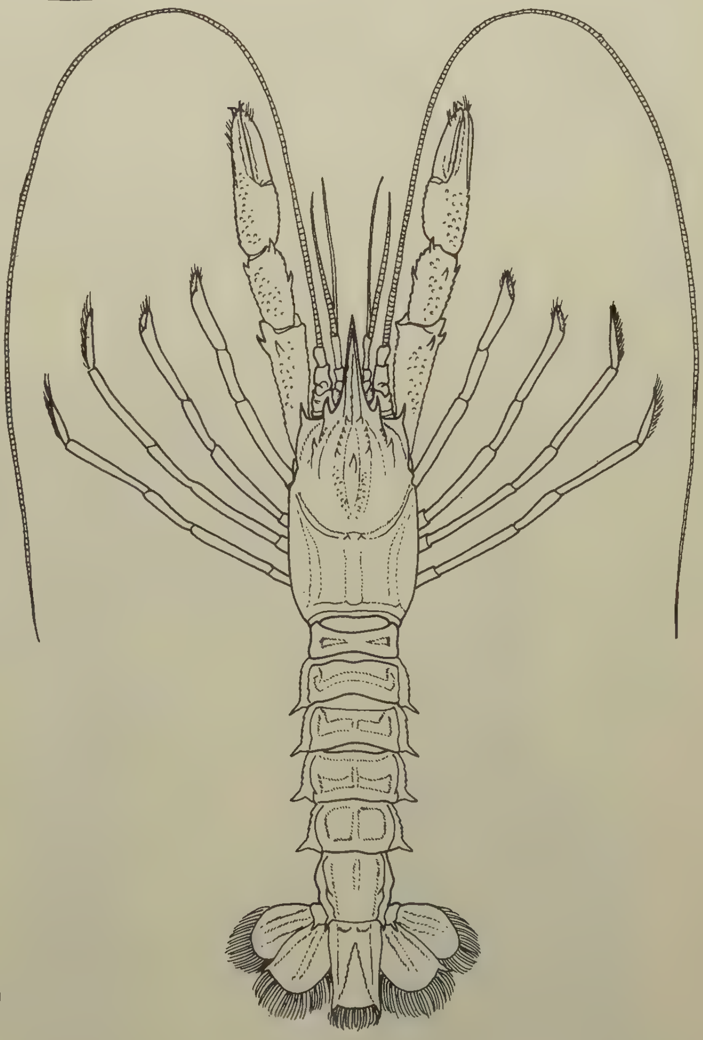


Fig. 72

Habitat and Biology : Deep sea from 580 to 1160 m, bottom mud or sandy mud.



(after Alcock, 1901)

Fig. 71

Size : Total length about 6 cm.

Interest to Fisheries : So far none. The species has been rarely caught, while also the fact that it is rather small and lives in the deep sea makes its commercial value less likely.

Literature : Alcock, 1901:162, pl. 1 fig. 2; Alcock & McArdle, 1902:pl. 58 fig 1; Macpherson, 1990:303, figs 5a,6,8a,b,16a.

Nephropsis malhaensis Borradaile, 1910

NEPH Nephps 7

Nephropsis malhaensis Borradaile, 1910, Transactions Linnean Society, London, Zoology, 13(2):262.

FAO Names : En - Saya de Malha lobsterette.

Type : Type locality: "dredged in 300 fms off Saya de Malha", Western Indian Ocean. Holotype in ZMC in alcohol, condition good.

Geographical Distribution : Only known from the type locality (Fig. 65).

Habitat and Biology : Deep sea, in 550 m.

Size : Total length of holotype, only specimen known, 7.75 cm.

Interest to Fisheries : None. The species, being only known from the holotype, is mentioned here solely for completeness' sake. There are no indications that it ever will have commercial possibilities.

Literature : Borradaile, 1910:262; Macpherson, 1990:317, figs 13a,b, 14c,d.

Remarks : The original description is short and not accompanied by a figure. Macpherson (1990) gave an additional illustrated description of the holotype.

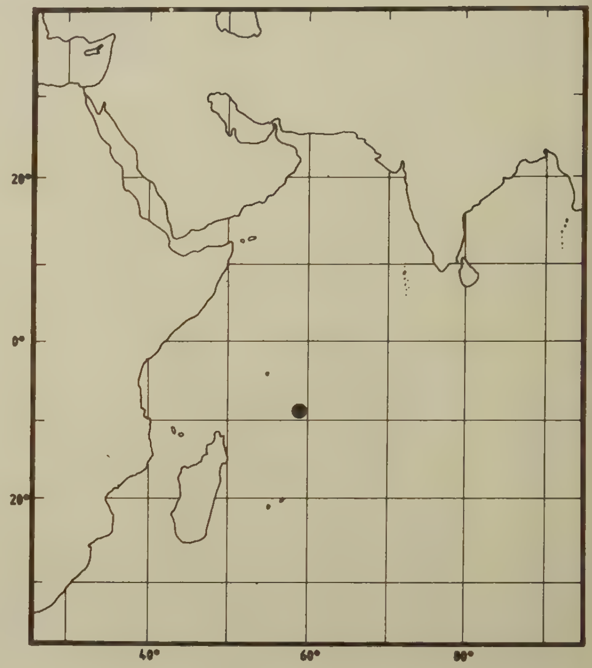


Fig. 73

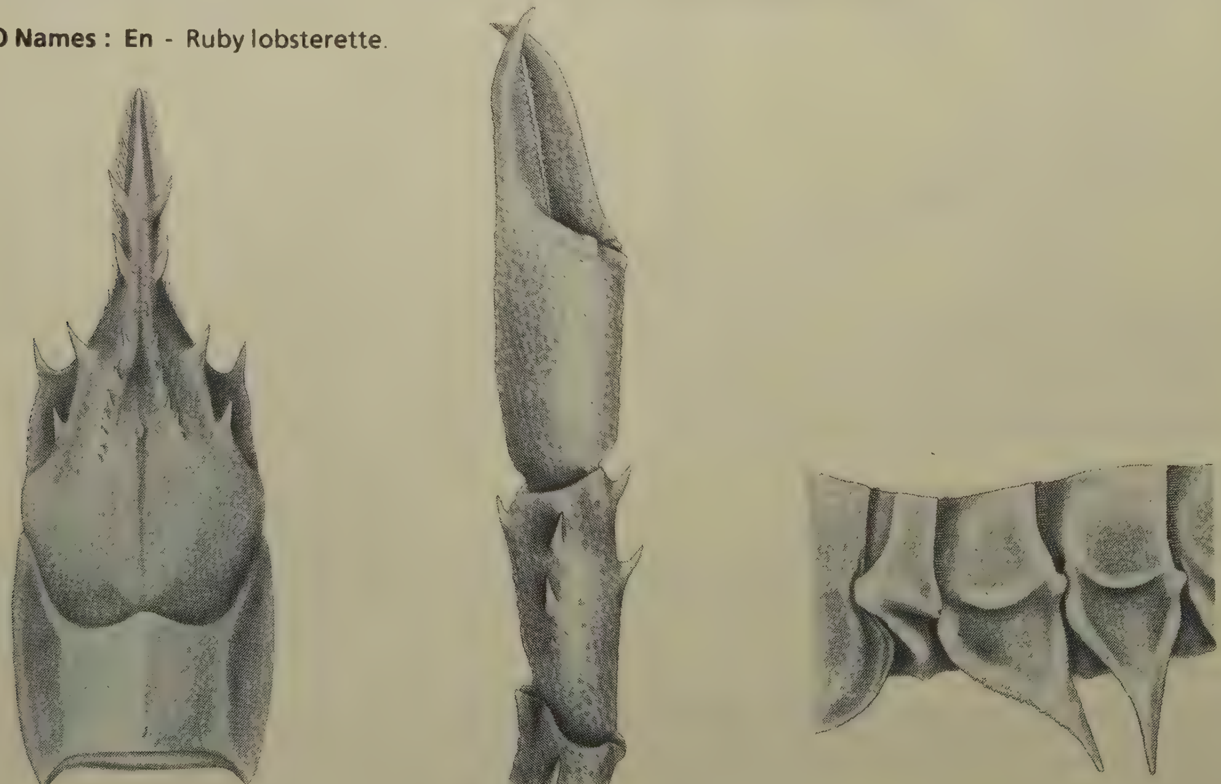
Nephropsis neglecta Holthuis, 1974

Fig. 74

NEPH Nephps 8

Nephropsis neglecta Holthuis, 1974, Bulletin Marine Science, University Miami, 24:792, fig. 18.

FAO Names : En - Ruby lobsterette.



a. carapace (dorsal view)

b. cheliped

c. abdomen (lateral view)

(from Holthuis, 1974)

Fig. 74

Type : Type locality: "16-20 miles S. of Dry Tortugas, Florida [USA], 1065 m". Holotype in USNM, no. 136690; paratypes in USNM, UMML, RMNH, MCZ.

Geographical Distribution : Western Atlantic from Florida (USA) to the Guianas, including the Caribbean Sea and the Lesser Antilles (Fig. 75).

Habitat and Biology : Deep sea between 655 and 1234 m, most catches between 800 and 1300 m; substrate sand or mud, sometimes with rubble.

Size : Carapace length between 1.5 and 3.5 cm, corresponding with a total length of about 3 to 7.5 cm.

Interest to Fisheries : So far none. The fact that the species is relatively small, usually taken singly or in pairs, and inhabits the deep sea, makes it not likely that it ever will be exploited commercially.

Literature : Original description.

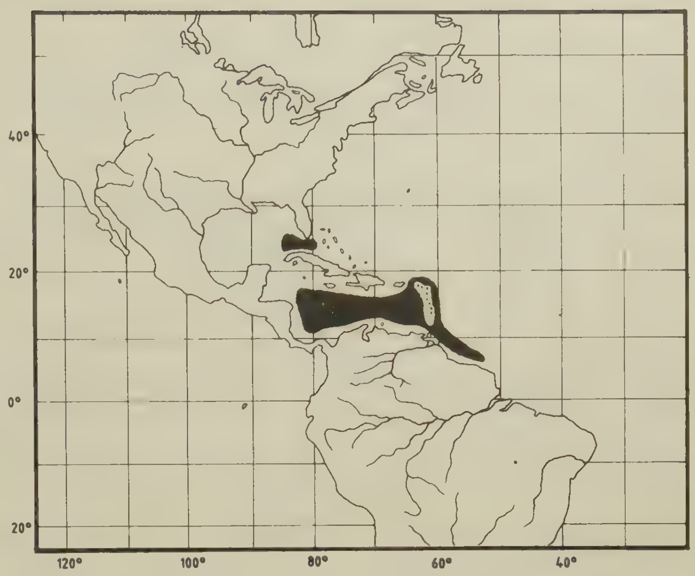


Fig. 75

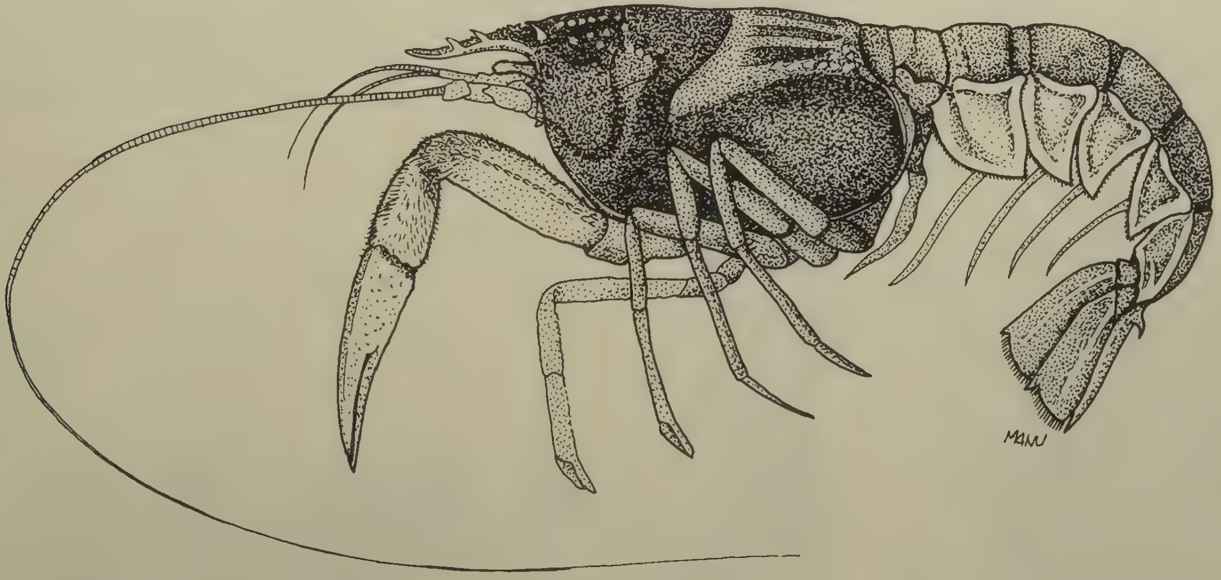
Nephropsis occidentalis Faxon, 1893

Fig. 76

NEPH Nephps 9

Nephropsis occidentalis Faxon, 1893, Bulletin Museum comparative Zoology, Harvard College, 24:195.

FAO Names : En - Pacific lobsterette; **Fr** - Langoustine du Pacifique; **Sp** - Cigala del Pacifico.



(after Faxon, 1895)

Fig. 76

Type : Type localities: "Albatross" Station 3418, off Acapulco, Mexico, 16°33'N 99°52'30"W; 660 fms [= 1207 m], brown sand, broken specks; syntype in USNM, no. 21081. "Albatross" Station 3424, near Tres Marias Islands, Mexico, 21°15'N 106°23'W, 676 fms [= 1236 m], grey sand, broken specks; syntype in USNM, no. 21082.

Geographical Distribution : Eastern Pacific from Baja California, Mexico (27°N) to Valparaiso, Chile (ca. 32°S) (Fig. 77). As Manning (1970:868) pointed out, the records from the Galapagos and Marion Islands are erroneous.

Habitat and Biology : Deep sea between 300 and 1200 m; muddy or sandy bottom.

Size : Total length 5 to 13 cm; carapace length 3,8-5.1. A published record giving the maximum length as 25 cm is clearly erroneous.

Interest to Fisheries : Retamal (1977:17) remarked that the species is commonly found in commercial catches of the shrimp ***Heterocarpus reedi*** Bahamonde in Chilean waters, and that with the right gear and a better knowledge of the habitat and habits of the species a commercial fishery might be feasible off Chile.

Local Names : CHILE: Camarón gigante, Camarón gigante de profundidad.

Literature : Faxon, 1895:127, pl. O fig. 1-16; Manning, 1970:865-70, fig. 1-3; Macpherson, 1990:308, figs 5c, 8e,f, 9a-c, 16c.

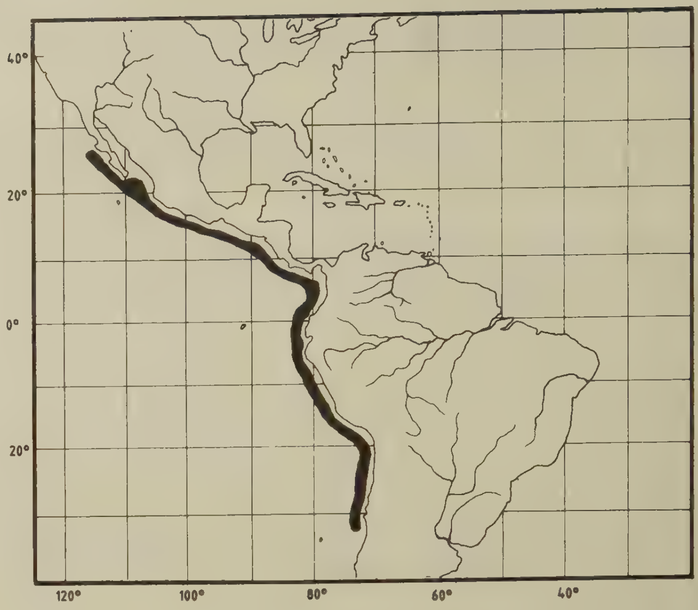


Fig. 77

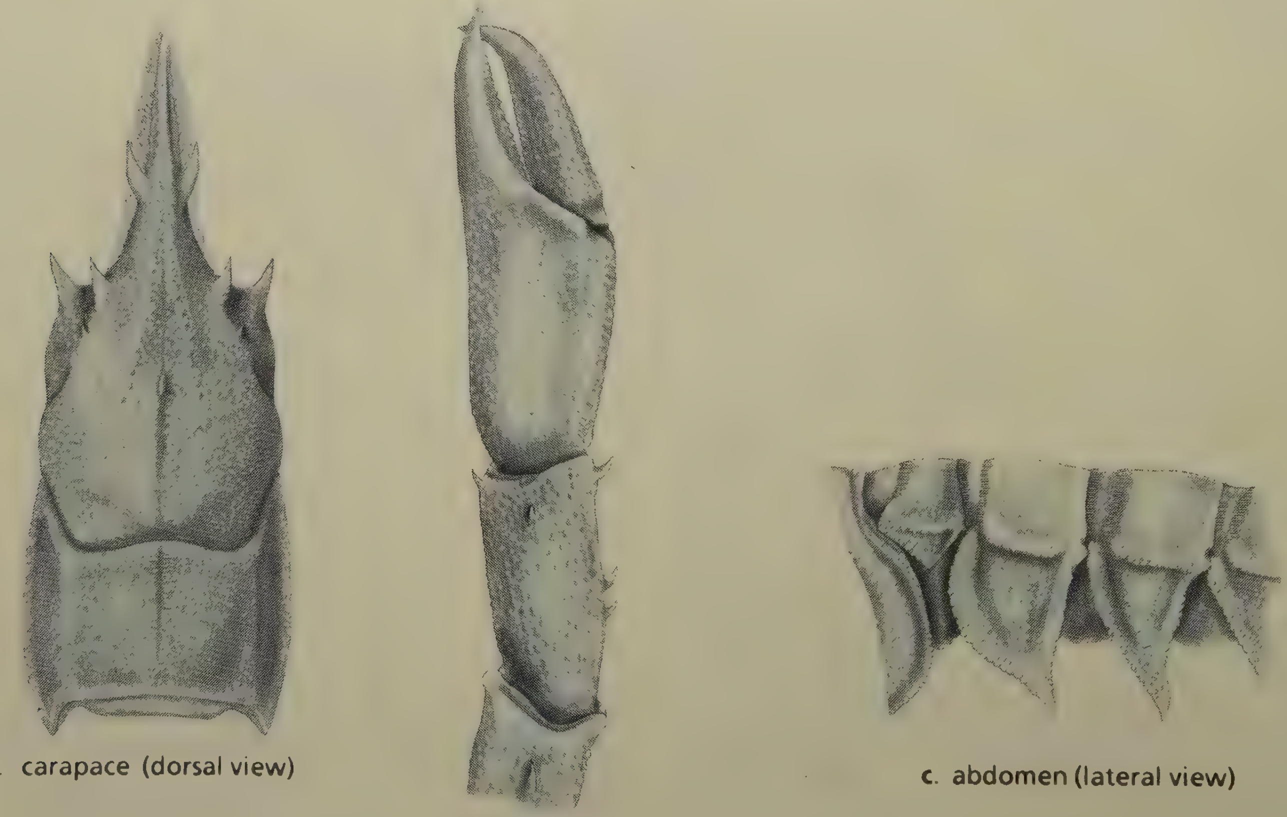
Nephropsis rosea Bate, 1888

Fig. 78

NEPH Nephps 10

Nephropsis rosea Bate, 1888, Report Voyage Challenger, Zool., 24:178, text-fig. 39, pl. 23 figs 1,2, pl. 24 fig. 1.

FAO Names : **En** - Two-toned lobsterette; **Fr** - Langoustine bicolore.



a. carapace (dorsal view)

b. cheliped

c. abdomen (lateral view)

(from Holthuis, 1974)

Fig. 78

Type : Type locality: "Challenger" Station 57, off Bermuda, 32°11'7"N 65°3'20"W; 1262 m. Holotype in BM, now completely disintegrated.

Geographical Distribution : Western Atlantic from Bermuda (32°N) to northern South America (Guiana, 7°N), including the Bahama Islands, the Gulf of Mexico and the Caribbean Sea (Fig. 79).

Habitat and Biology : Deep sea between 420 and 1260 m, mostly between 500 and 800 m. On muddy or sandy bottoms.

Size : Carapace length between 1 and 6 cm, corresponding to a total length of about 2 to 13 cm.

Interest to Fisheries : Potential. The species is not rare and some of the hauls reported contain several specimens. With proper gear and a better knowledge of its habits and habitat, it may perhaps be possible to fish it commercially.

Literature : Holthuis, 1974:787, figs 16C,D, 17.

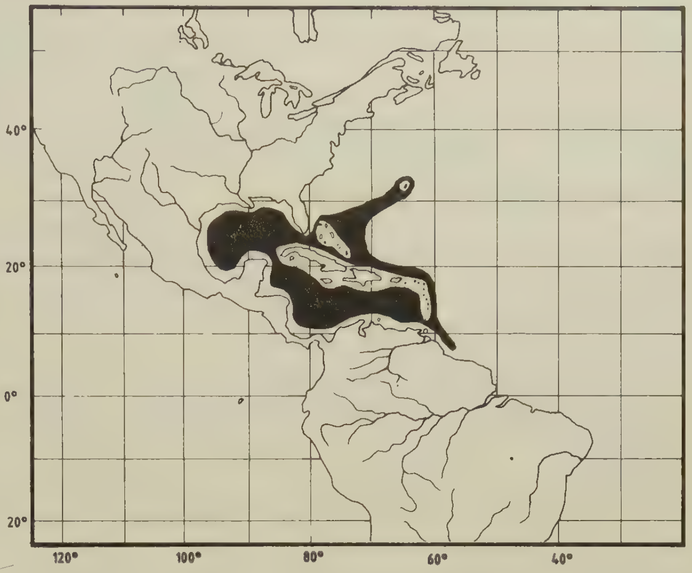


Fig. 79

Nephropsis stewarti Wood-Mason, 1872

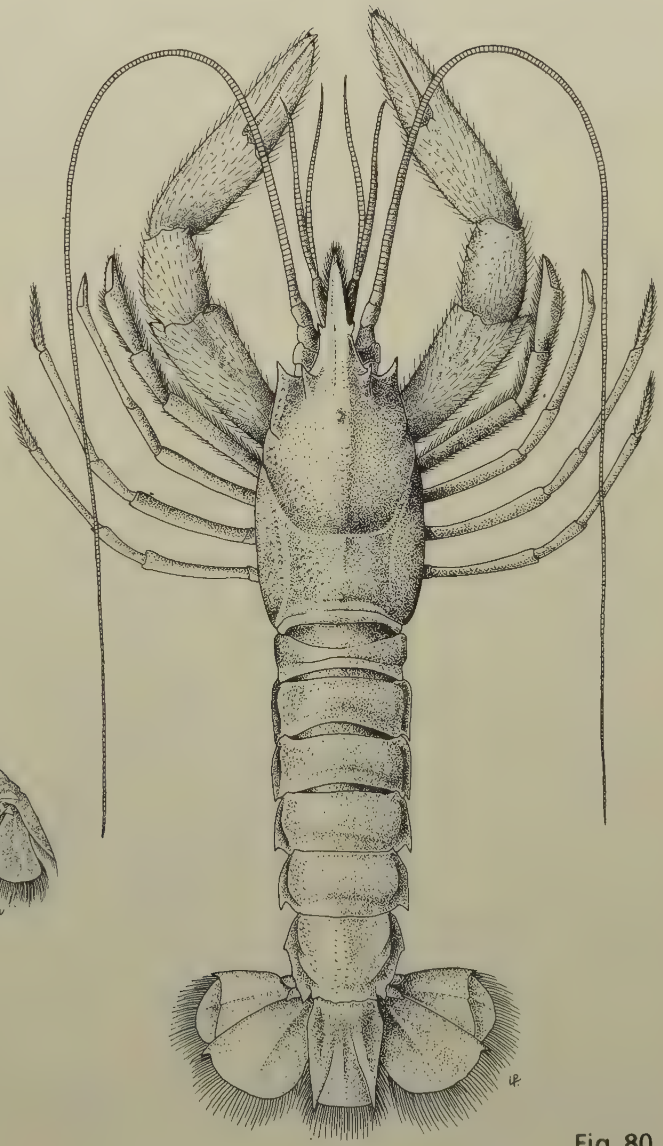
Fig. 80

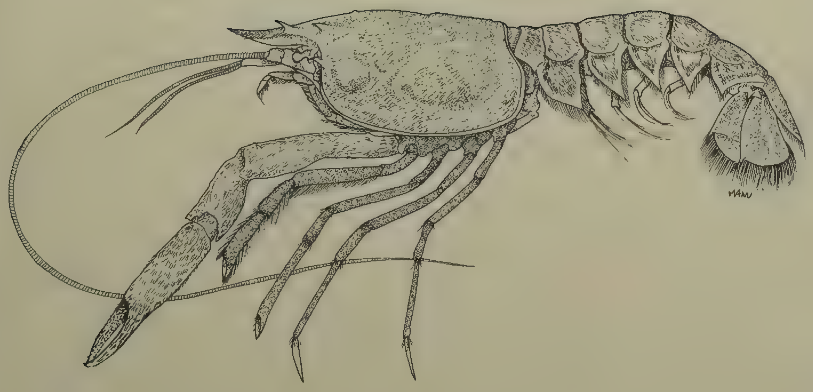
NEPH Nephps 3

Nephropsis stewarti Wood-Mason, 1872, Proceedings Asiatic Society Bengal, 1872:151. Specific name placed on the Official List of Specific names in Zoology in Opinion 559 (published in 1959).

FAO Names : **En** - Indian Ocean lobsterette; **Fr** - Langoustine indienne; **Sp** - Cigala del Oceano Indico.

Type : Type locality: "dredged in from 260 to 300 fathoms [= 476-550 m] about 25 miles off Ross Island on the eastern coast of the Andamans", Andaman Sea, India. Holotype in ZSI, no. 1404, in alcohol, condition poor.





(after Alcock & Anderson, 1896)

Fig. 80

Geographical Distribution : Indo-West Pacific region from the Gulf of Aden and East Africa to Japan (Sagami Bay to Tosa Bay), Taiwan, the Philippines, Indonesia and Western Australia (Fig. 81).

Habitat and Biology : Deep sea between 170 and over 1060 m, usually between 500 and 750 m. On soft muddy substrates.

Size : Maximum body length 15 cm, common around 10 cm. Carapace length: male 2.2-7.1 cm; female 1.4-7 cm; ovigerous females 4.2-7 cm.

Interest to Fisheries : So far none, but perhaps of potential interest. Crosnier & Jouannic (1973:13) reported small catches in exploratory trawling off Madagascar (1/2 kg per hour or less), but consider that the species "paraît présenter peu d'intérêt" for commercial fishery.

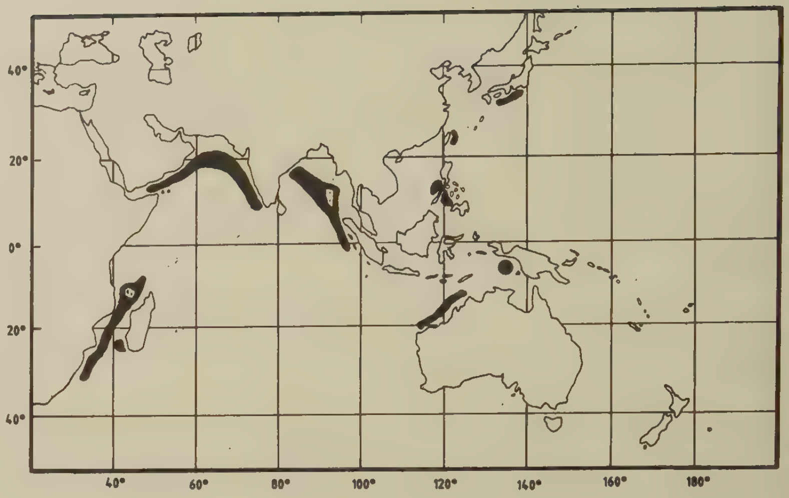


Fig.81

Local Names: AUSTRALIA: Stewart's scampi; JAPAN: Okina-ebi (= old gentleman); MOZAMBIQUE: Lagostim indiano.

Literature : Fischer & Bianchi (eds), 1984:vol.5; Macpherson, 1990:312, figs 5e, 10, 11c,d, 16e.

Nephropsis suhmi Bate, 1888

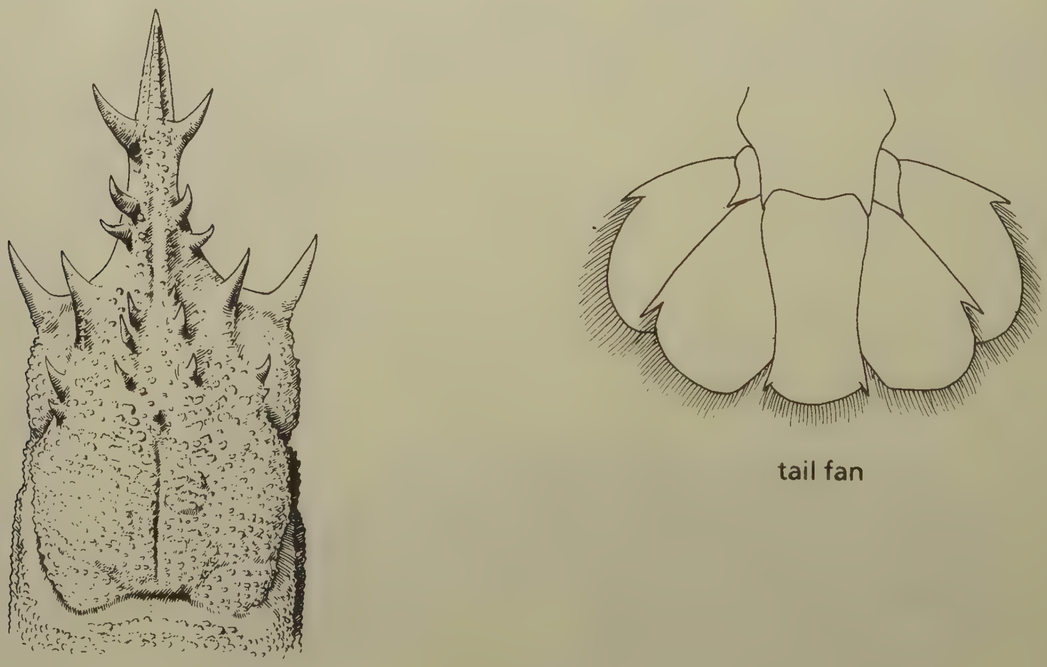
Fig. 82

NEPH Nephps 11

Nephropsis suhmi Bate, 1888, Report Voyage Challenger, Zoology, 24:181, pl. 23 fig. 3, pl. 24 fig. 2.

Synonyms : ***Nephropsis orientalis*** Bate, 1888:171, 175 (a name that Bate evidently originally intended for the species, and which on p. 171 and 175 he forgot to change to ***N. suhmi***, of which it is to be considered an objective synonym).

FAO Names : **En** - Red and white lobsterette.



anterior part of carapace (dorsal view)

(from Macpherson, 1990)

tail fan

Fig. 82

Type : Type locality: "Challenger" Station 191, "lat. 5°41'S, long. 134°4'30"E.; off Dobba, Arrou Island [= Dobo, Aru Islands, Indonesia]; depth 800 fathoms [= 1463 m]; bottom green mud". Holotype in BM, no. 88.22 (in alcohol, condition fair).

Geographical Distribution : Indo-West Pacific region: western Indian Ocean (Gulf of Aden, Arabian Sea), Madagascar, Indonesia (Makassar Strait, Aru Islands), Australia (E. of Queensland), New Caledonia (Fig. 83).

Habitat and Biology : Deep sea between 786 and 2029 m, most catches between 1600 and 1900 m. Substrate: mud.

Size : Total length between 2 and 11 cm, carapace length between 0.8 and 5.9 cm.

Interest to Fisheries : So far none. A better knowledge of its biology and occurrence may show the species to be of potential interest. The soft substrate on which it lives indicates that it could best be obtained by trawling, but the efficiency of this and other gear should be tested experimentally.

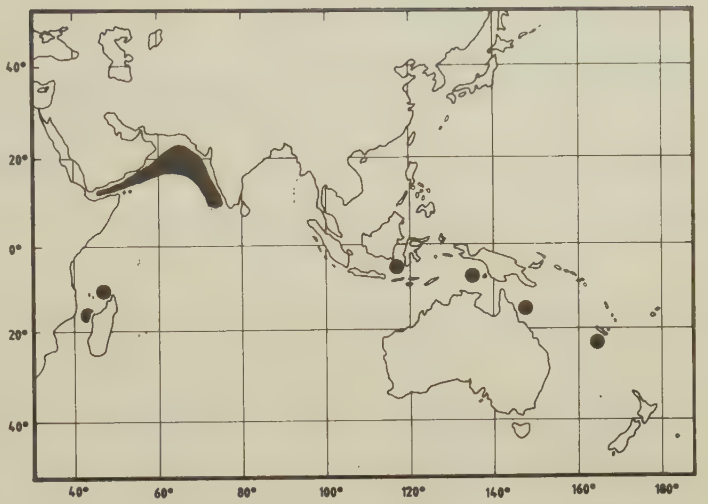


Fig. 83

Literature : Original description; Alcock, 1901:163; Macpherson, 1990:306, figs 5b, 7d-f, 8c,d.

Nephropsis sulcata Macpherson, 1990

Fig. 84

NEPH Nephps 13

Nphropsis sulcata Macpherson, 1990, Mémoires Muséum National Histoire naturelle, Paris, (A) 145:319, figs. 13e-g, 14a,b, 15a,b, 16g.

FAO Names : En - Grooved lobsterette.

Type : Type locality: Philippines, 13°53.7'N 119°56.3'E, 865 m. Holotype male, MP no. AS 523.

Geographical Distribution : Indo-West Pacific: South Africa (Natal), Madagascar, Laccadive Sea, South China Sea, Philippines, Australia (E. of Queensland), Chesterfield Islands, New Caledonia (Fig. 85)

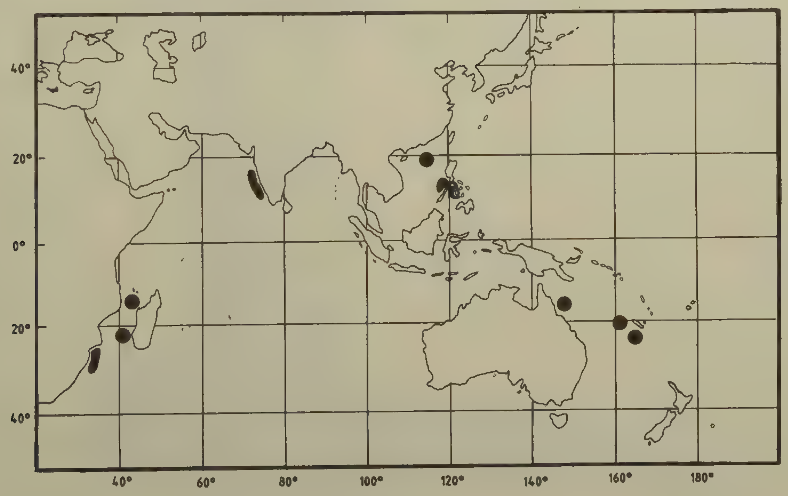
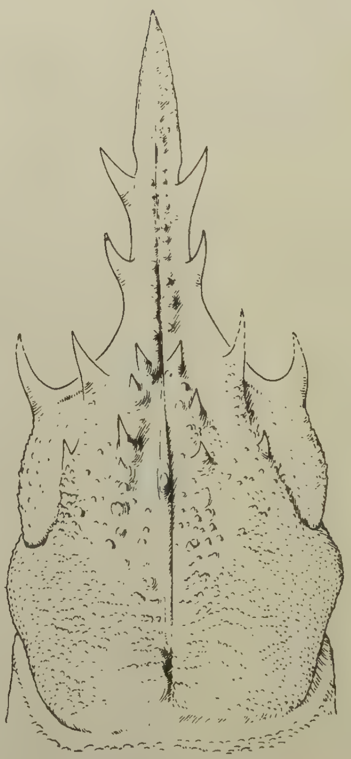


Fig. 85



anterior part of
carapace (dorsal view)

(from Macpherson, 1990) Fig. 84

Habitat and Biology : Deep sea between 750 and 1115 m. Muddy bottom.

Size : Carapace length, including rostrum: male 1.5 to 3 cm; female 1.8 to 3.4 cm, smallest ovigerous female 2.6 cm.

Interest to Fisheries : So far none.

Literature : Original description.

Remarks: The species has often been confused with ***N. atlantica*** and most, if not all, records of ***N. atlantica*** from the Indo-West Pacific region pertain to the present species.

Thymops Holthuis, 1974

NEPH Thym

Thymops Holthuis, 1974, Bulletin Marine Science, University Miami, 24(4):763. Gender masculine.

Type Species : by original designation and monotypy: ***Nephropides birsteini*** Zarenkov & Semenov, 1972.

The genus so far is known to have a single species.

Thymops birsteini (Zarenkov & Semenov, 1972)

Fig. 86

NEPH Thym 1

Nephropides birsteini Zarenkov & Semenov, 1972, Zoologicheski Journal Moscow, 51:599, figs 1-6

FAO Names : En - Patagonian lobsterette.

Type : Type locality: "Akademik Knipovich" Station 1021, 49°00.8'S 57°07.6'W, 515-525 m. Holotype male in Zoological Museum, University of Moscow.

Geographical Distribution : Continental shelf of southern tip of South America, on the Atlantic side (Argentina) south of 37°S, on the Pacific side (Chile) south of 51°S; including the area north, east and southeast of the Falkland/Malvinas Islands, and east of South Georgia. The entire area lies between 37° and 57°S and 35° and 76°W (Fig. 87).

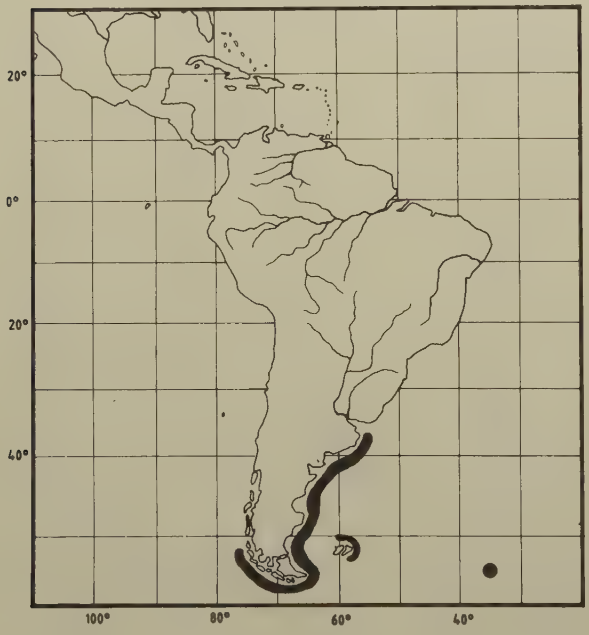
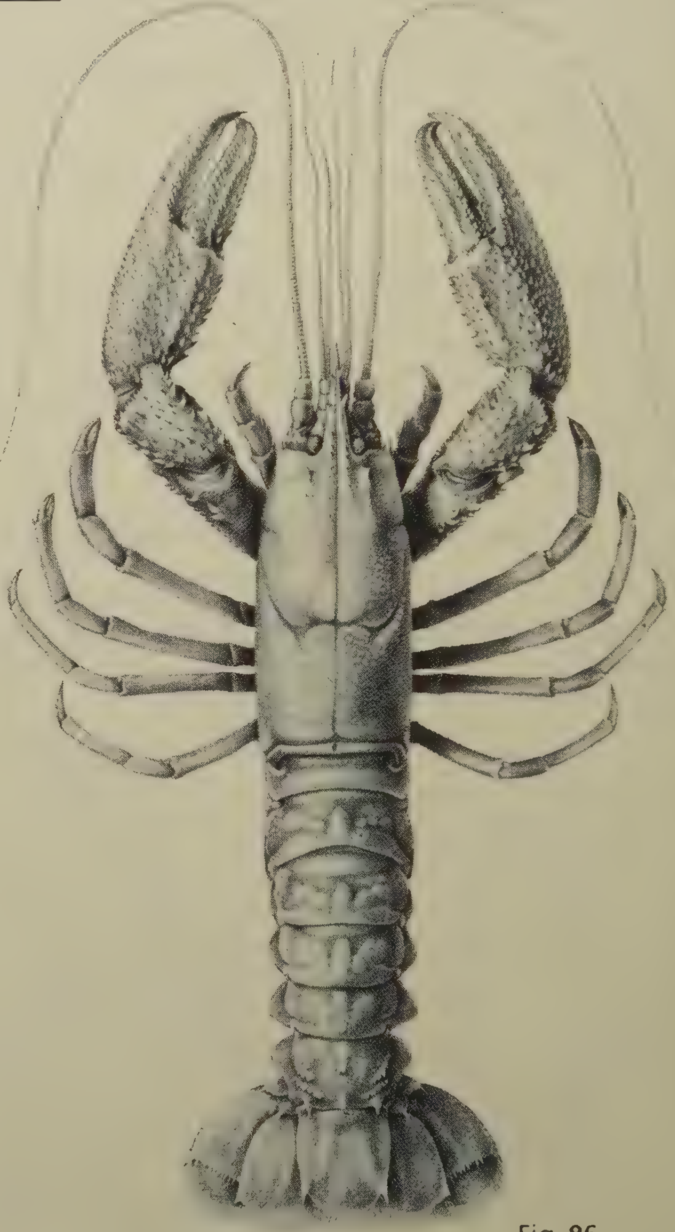


Fig. 87



(from Holthuis 1974)

Fig. 86

Habitat and Biology : Deep sea between 122 and 1400 m, mostly between 122 and 900 m.

Size : Total length reported from 8 to 25 cm; carapace length from 2 to 10 cm (mostly between 3 and 6 cm). Ovigerous females with cl. 3.4 to 7.4 cm.

Interest to Fisheries : According to Boschi, Irio & Fischbach (1982:233) the species would be of potential interest off the Argentine coast if large concentrations could be detected.

Local Names : ARGENTINA: Langosta de aguas profundas.

Literature : Holthuis, 1974:764, figs 13, 14.

Thymopsis Holthuis, 1974

NEPH Thymop

Thymopsis Holthuis, 1974, Bulletin Marine Science, University Miami, 24(4):754. Gender feminine.

Type Species: by original designation and monotypy: ***Thymopsis nilenta*** Holthuis, 1974.

A single species is known in this genus.

Thymopsis nilenta Holthuis, 1974

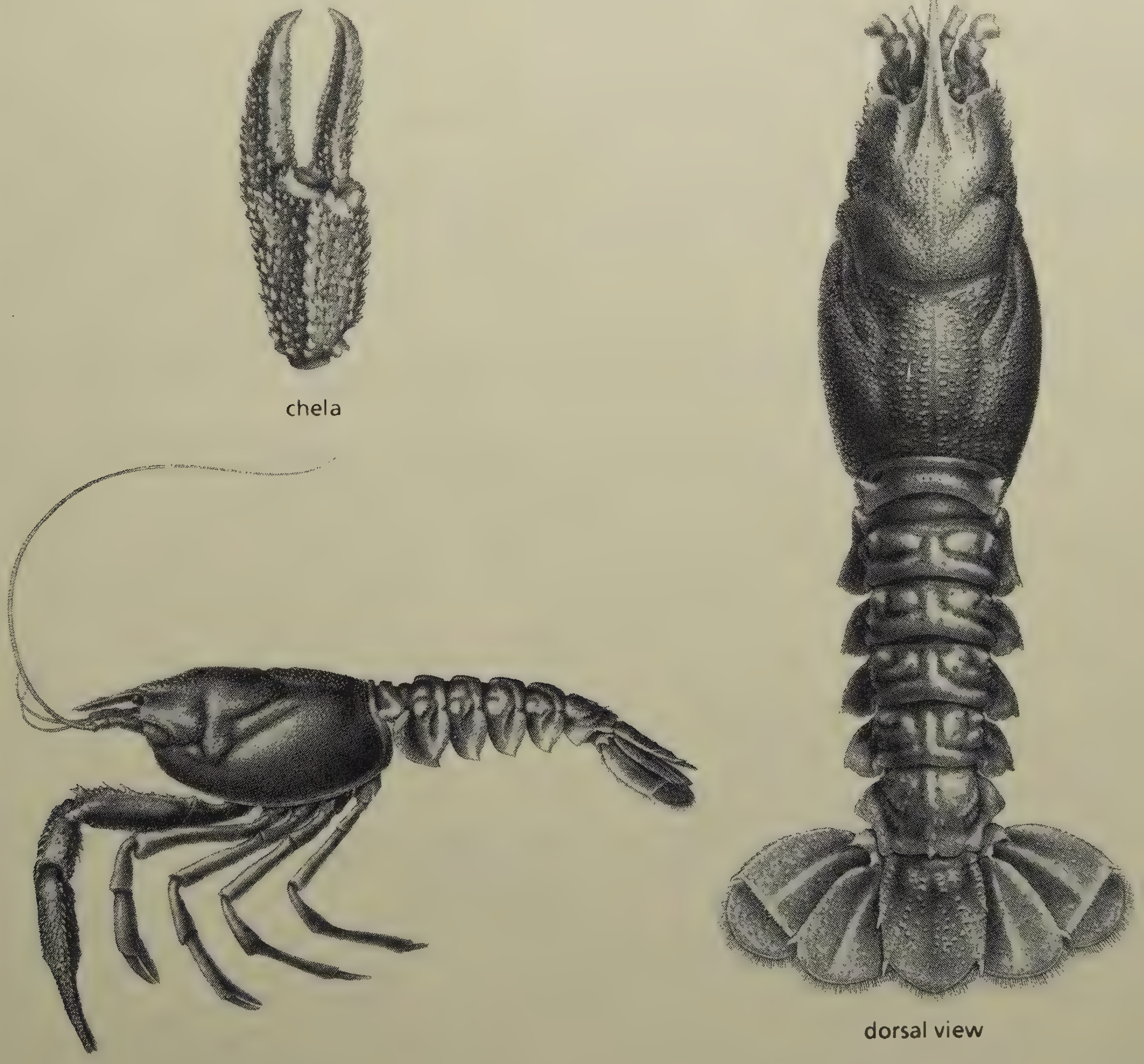
Fig. 88

NEPH Thymop 1

Thymopsis nilenta Holthuis, 1974, Bulletin Marine Science, University Miami, 24(4):756, fig. 10-12.

FAO Names : En - Nilenta lobsterette.

Type : Type locality: "Eltanin" 22 Station 1555, " S of South Georgia, 60°04'S-60°08'S, 35°59'W-36°04'W, 1976-2068 m". Holotype female in USNM, no. 141257; paratypes in USNM, RMNH.



chela

lateral view

dorsal view

(from Holthuis 1974)

Fig. 88

Geographical Distribution : Southern Atlantic. So far only known from two localities: southeast of the Falkland/Malvinas Islands (55°01'-55°10'S 39°55' - 39°46'W) and south of South Georgia (60°04' - 60°08'S 35°59' - 36°04'W) (Fig. 89).

Habitat and Biology : Deep sea between (1976-) 2068 and 2886 (-3040) m.

Size : Total body length about 15 cm, carapace length (without rostrum) 5 to 6 cm.

Interest to Fisheries : None so far. Until now only 4 specimens have been collected of this species. Its scarcity and the very great depths at which it is found, make it an unlikely candidate for a fishery, notwithstanding its relatively good size.

Literature : Original description.

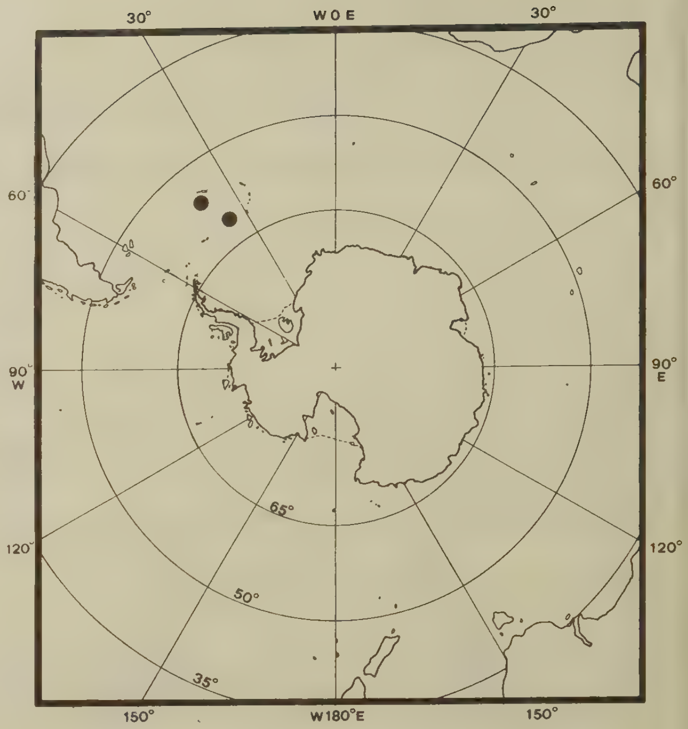


Fig. 89

SUBFAMILY **NEPHROPINAE** Dana, 1852

Nephropinae Dana, 1852, Proceedings Academy Natural Sciences, Philadelphia, 6:15.

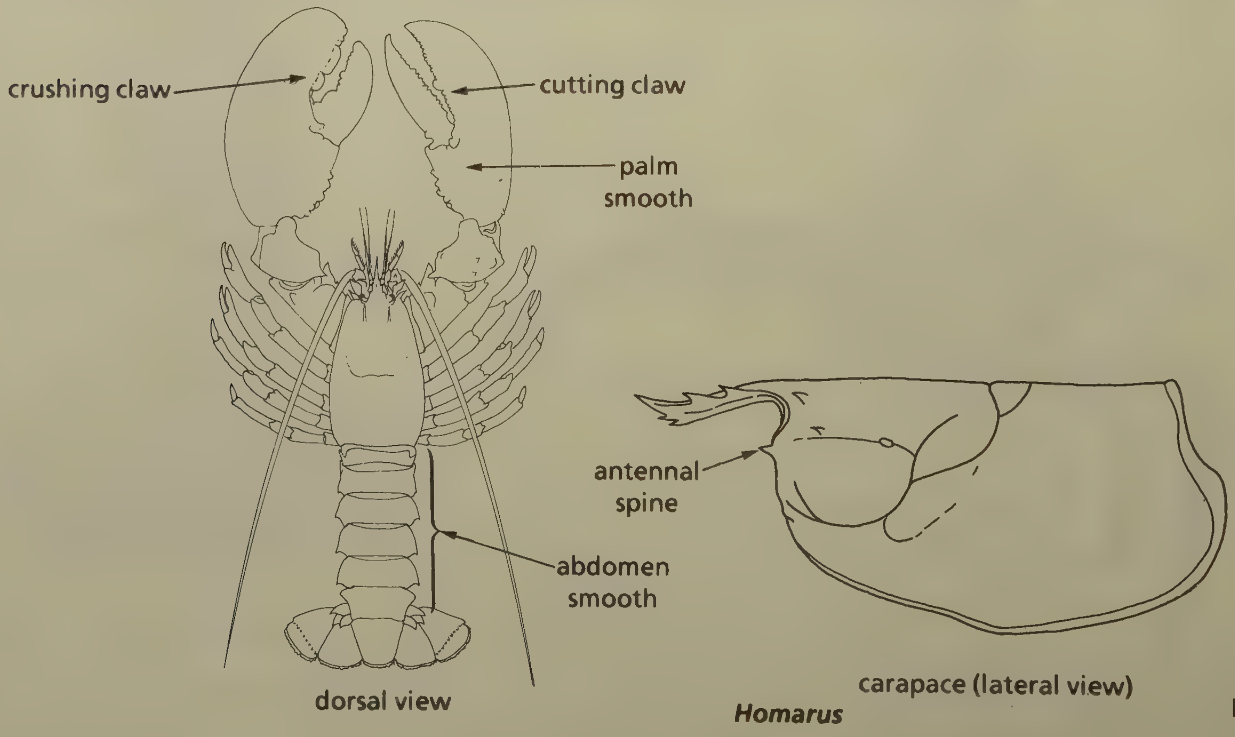
This, the typical subfamily of Nephropid lobsters, contains the following 5 genera. ***Eunephrops***, ***Homarus***, ***Metanephrops***, ***Nephrops*** and ***Thymopides***.

All species of Nephropinae are of present or potential commercial interest, and all are listed here.

Key to Genera:

1a. Left and right first chelipeds unequal, one a crushing claw, the other a cutting claw. Antennal spines without a strong posterior carina (Figs 90, 91). First abdominal sternite of the male without a median spine

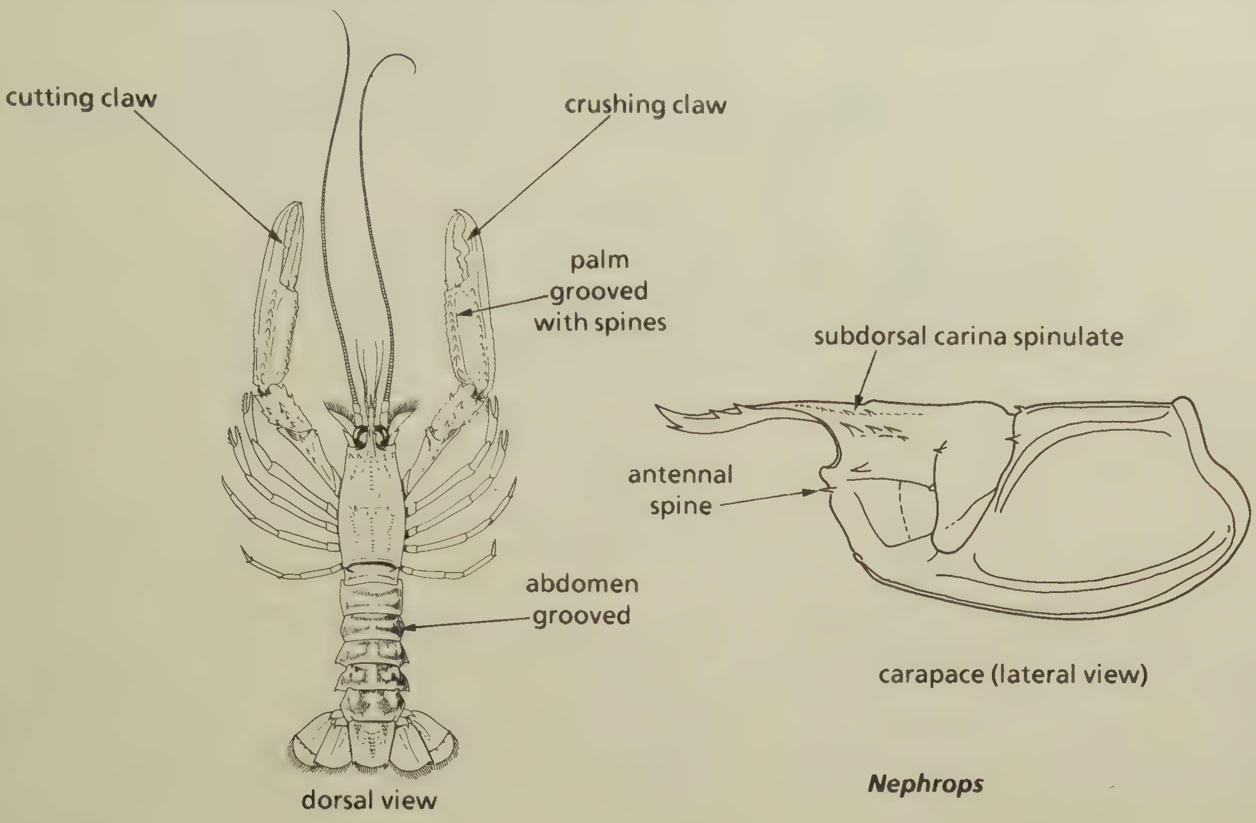
2a. Palm of first chelipeds smooth, without ridges. Subdorsal carinae without spinules. Abdominal somites smooth, without grooves; no carinae separating the tergites from the pleura (Fig. 90) .... ***Homarus***



Homarus

Fig. 90

2b. Palm of first chelipeds with distinct longitudinal grooves, ridges and rows of spines. Subdorsal carinae spinulate. Abdominal somites dorsally with distinct transverse grooves, a blunt carina separates the tergites from the pleura (Fig. 91) .... ***Nephrops***

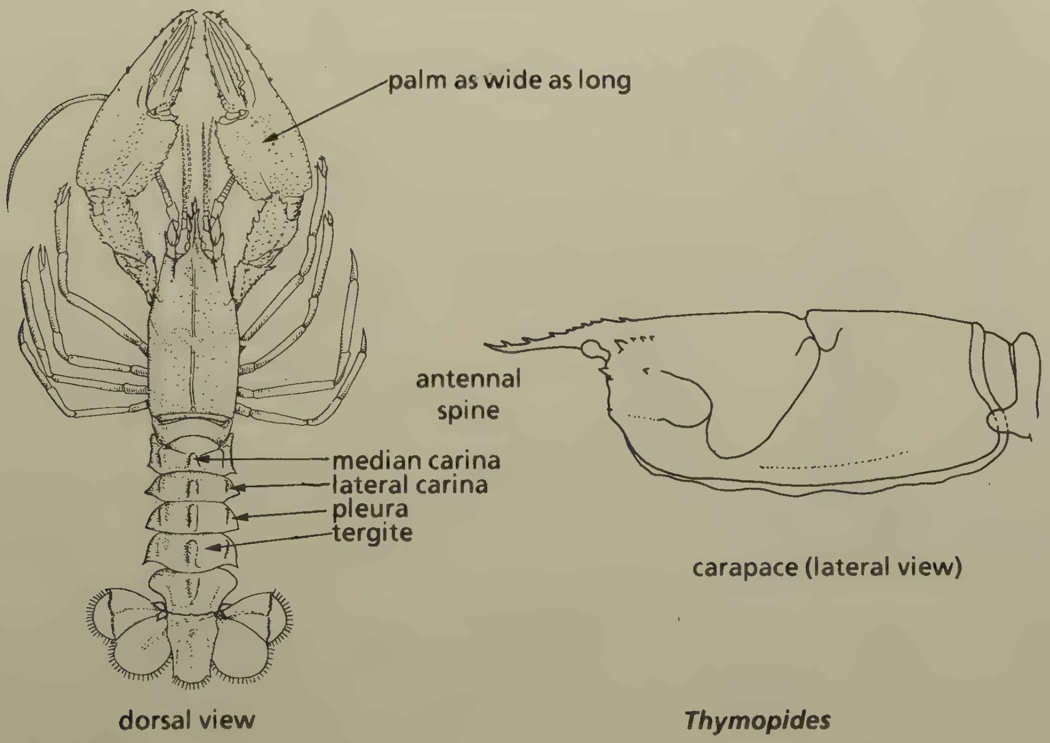

cutting claw
crushing claw
palm grooved with spines
subdorsal carina spinulate
antennal spine
abdomen grooved
carapace (lateral view)
dorsal view

Nephrops Fig. 91

1b. Left and right chelipeds of the first pair similar in size and shape. Antennal spine in most species followed by a strong carina. A distinct carina separates the abdominal tergites from the pleura. First abdominal sternite of the male with a median spine (this character not known from ***Thymopides***)

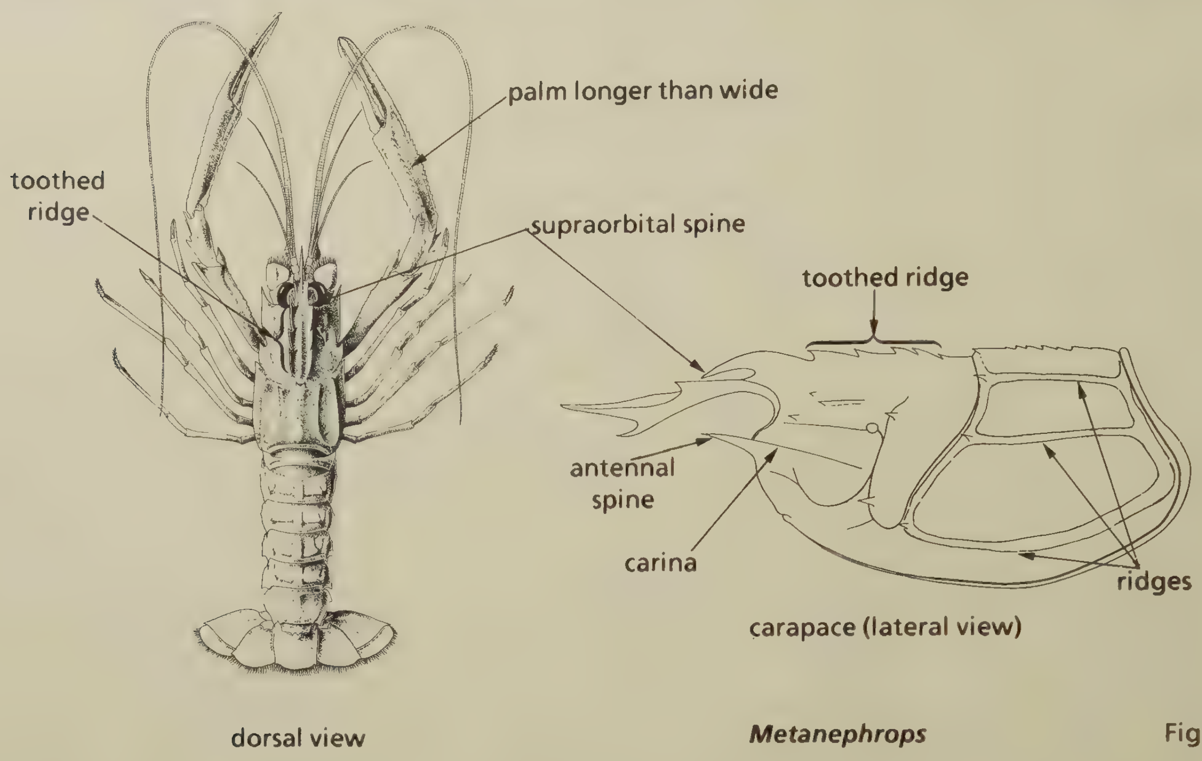
3a. Antennal spine not followed by a strong carina. Palm of first chela as wide as long. Abdomen with a blunt median carina (Fig. 92) .... ***Thymopides***

3b. Antennal spine followed by a strong carina. Palm of first chela distinctly longer than wide


palm as wide as long
antennal spine
median carina
lateral carina
pleura
tergite
carapace (lateral view)
dorsal view

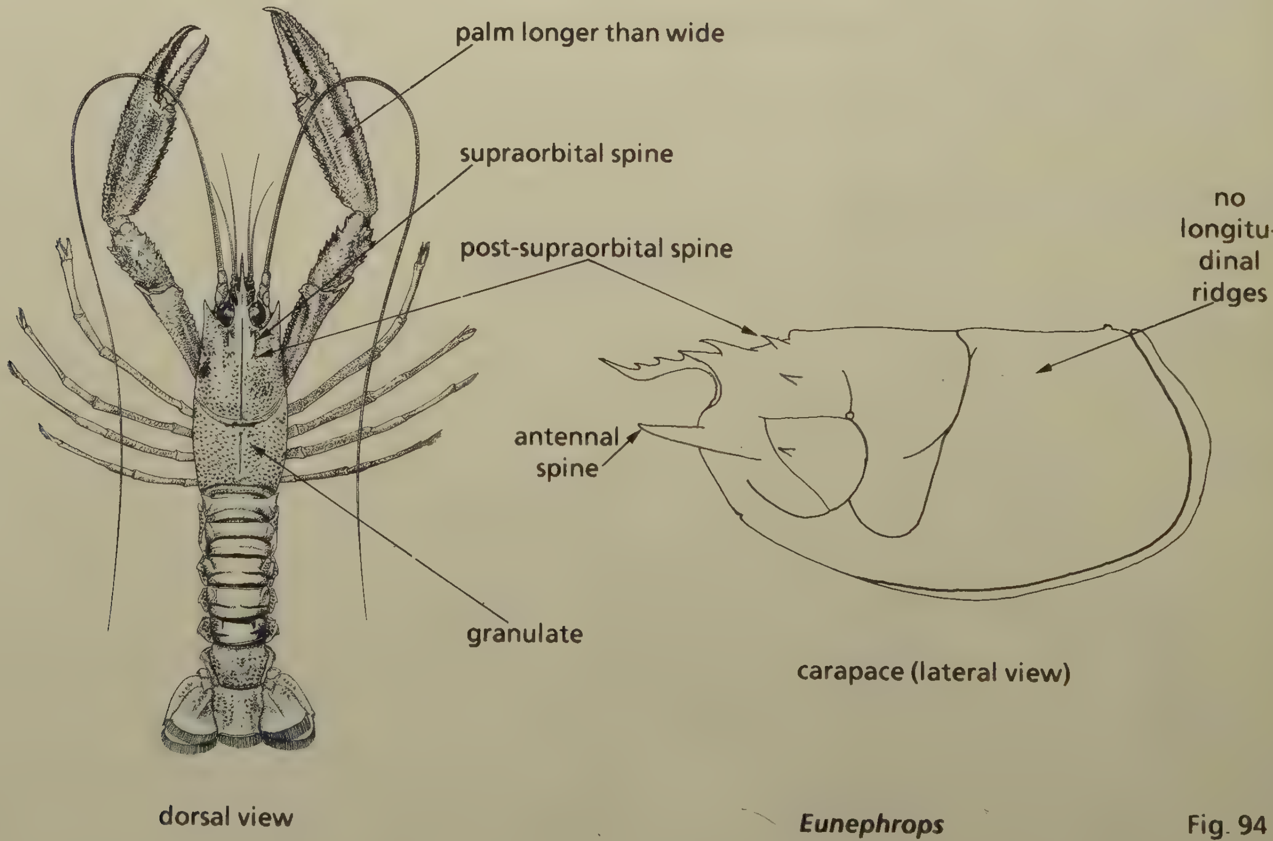
Thymopides Fig. 92

4a. Supraorbital spine followed by a strong toothed ridge which extends almost to the postcervical groove. Posterior part of carapace with several longitudinal carinae (Fig. 93) .... ***Metanephrops***


palm longer than wide
toothed ridge
supraorbital spine
toothed ridge
antennal spine
carina
ridges
carapace (lateral view)
dorsal view

Metanephrops Fig. 93

4b. Supraorbital spine followed by a single post-supraorbital spine, no supraorbital carina is present. The posterior part of the carapace is evenly granulate, without longitudinal carinae (Fig. 94) .... ***Eunephrops***


palm longer than wide
supraorbital spine
post-supraorbital spine
no longitudinal ridges
antennal spine
granulate
carapace (lateral view)
dorsal view

Eunephrops Fig. 94

Eunephrops S.I. Smith, 1885

NEPH Euneph

Eunephrops S.I. Smith, 1885, Proceedings United States National Museum, 8:167. Gender masculine.

Type Species: by monotypy: ***Eunephrops bairdii*** S.I. Smith, 1885.

The genus is restricted to the Western Atlantic and has three known species, all of which inhabit the deep sea. They are of potential interest for fishery.

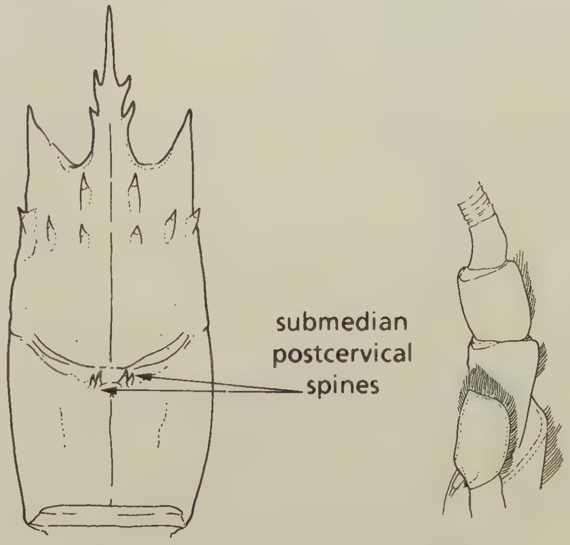
Key to Species:

1a. Carapace with submedian postcervical spines. No spine at the base of the scaphocerite (Fig. 95). Second pereiopod with the fingers slightly less than half as long as the palm (Fig. 96a) .... ***E. bairdii*** (Fig. 98)

1b. Carapace without postcervical spines. A spine on the antennal peduncle near the base of the scaphocerite. Second pereiopod with the fingers less than 1/3 as long as the palm (Fig. 96 b,c)

2a. Abdominal somites with distinct longitudinal median carina (Fig. 97a). Scaphocerite reaching to the base of the ultimate segment of the antennal peduncle. Third pereiopod with the fingers about 1/3 of the length of the palm .... ***E. cadenasi*** (Fig. 100)

2b. Abdominal somites with a single transverse groove, which is interrupted in the middle; no median carina is present (Fig. 97b). Scaphocerite small, failing to reach the middle of the penultimate segment of the antennal peduncle. Third pereiopod with the fingers about 1/5 of the length of the palm .... ***E. manningi*** (Fig. 102)



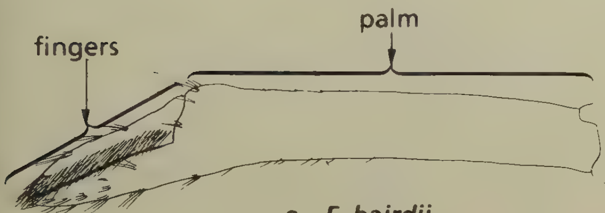
carapace (dorsal view)

scaphocerite

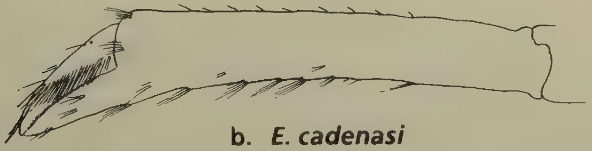
E. bairdii

(after Holthuis, 1974)

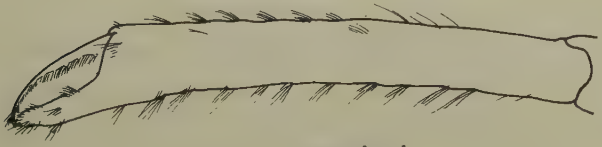
Fig. 95



a. ***E. bairdii***



b. ***E. cadenasi***

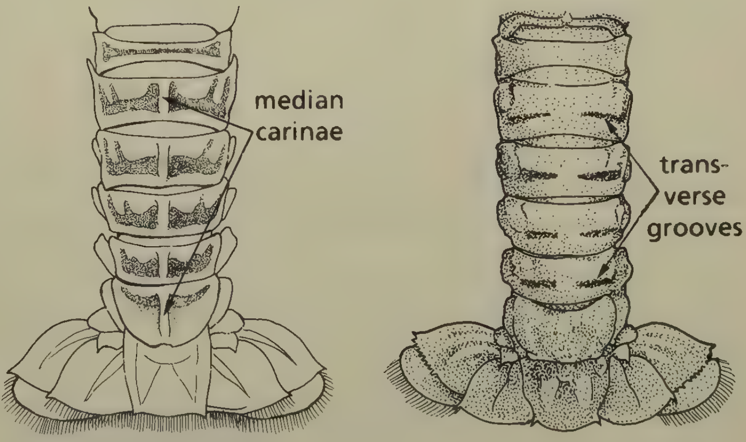


c. ***E. manningi***

chelae of second pereiopod

(from Holthuis, 1974)

Fig. 96



a. ***E. cadenasi***

b. ***E. manningi***

abdomen (dorsal view)

Fig. 97

Eunephrops bairdii S.I. Smith, 1885

NEPH Euneph 1

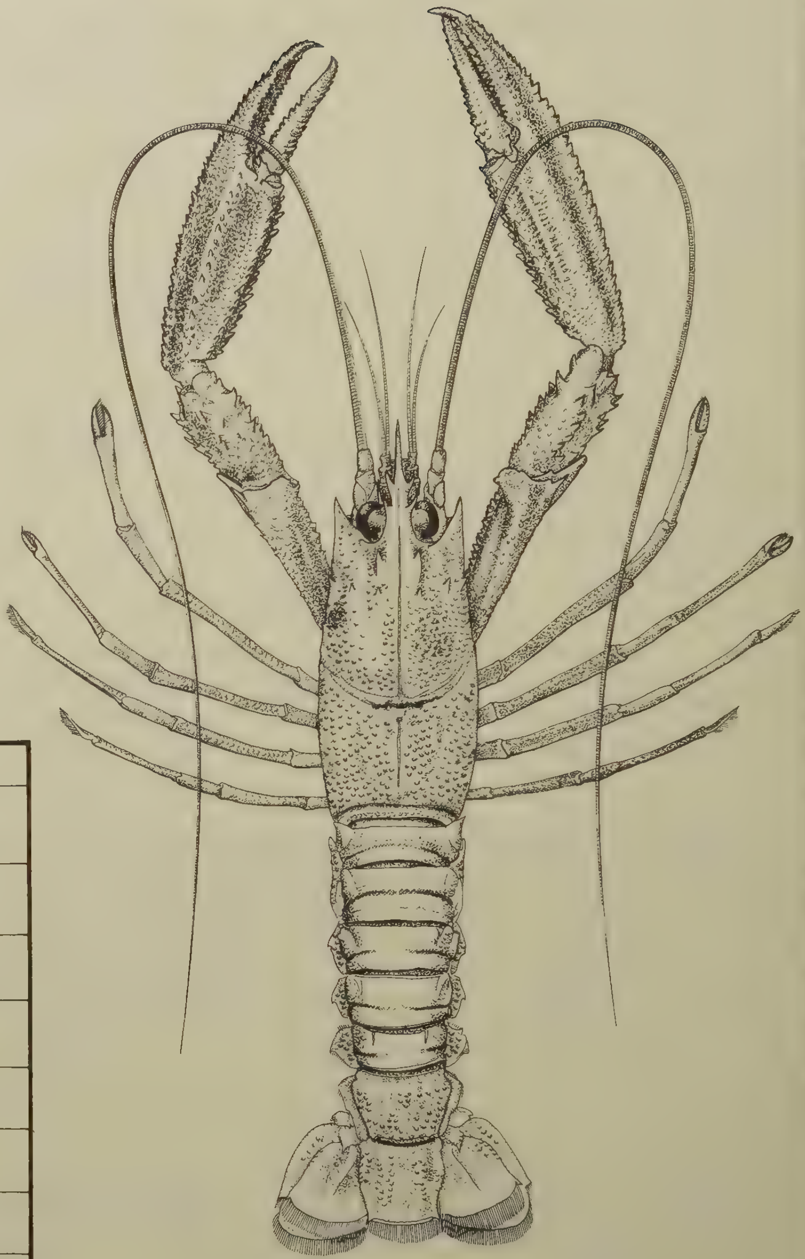
Eunephrops bairdii S.I. Smith, 1885, Proceedings United States National Museum, 8:167.

FAO Names : **En** - Red lobster; **Fr** - Langoustine rouge; **Sp** - Cigala colorada.

Type : Type locality: "Albatross" "Station 2143, March 23, 1884; Gulf of Darien; north latitude 9°30'45", west longitude 76°25'30"; 155 fathoms [= 284 m]; green mud". Female holotype in USNM, No. 6937.

Geographical Distribution : Western Atlantic: southwest Caribbean Sea off Colombia and Panama (Fig. 99).

Fig. 98



(after Holthuis, 1974)

Fig. 98

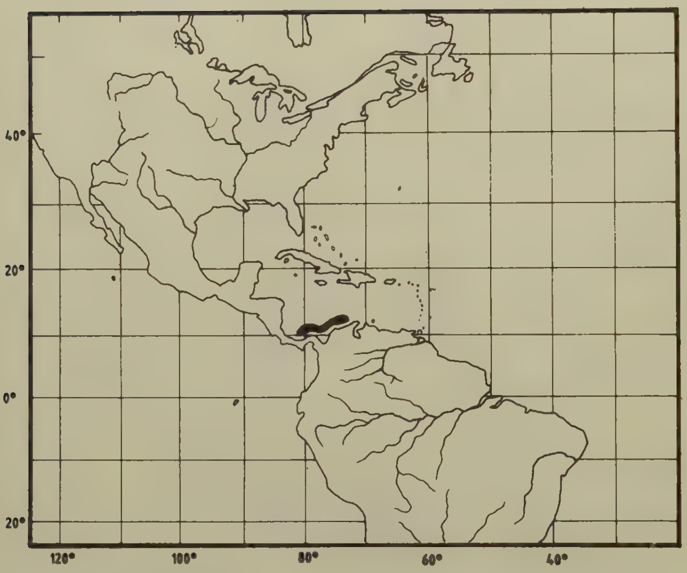


Fig. 99

Habitat and Biology : Depth range between 230 and 360 (-400) m. Soft substrate (mud or coralline rubble).

Size : Carapace length between 4 and 9 cm. Maximum total length about 20 cm.

Interest to Fisheries : The species has been taken occasionally during exploratory commercial fishing. Its large size makes it an attractive fishery subject, but the fact that it seems to be scarce and lives in great depths detracts from its possible commercial value.

Literature : Holthuis, 1974:842, figs 27-29; Fischer (ed.), 1978: vol. 6.

Eunephrops cadenasi Chace, 1939

Fig. 100

NEPH Euneph 2

Eunephrops cadenasi Chace, 1939, Memorias Sociedad Cubana Historia natural, 13:40.

FAO Names : En - Sculptured lobster.

Type : Type locality: "Nicholas Channel south of Cay Sal Bank, Lat. 23°21'N, Long. 79°58'W, 300-315 fathoms [=550-576 m]". Holotype female in MCZ.

Geographical Distribution : Western Atlantic: off Bahama Islands and Dominica; Caribbean Sea near Jamaica and Colombia (Fig. 101).

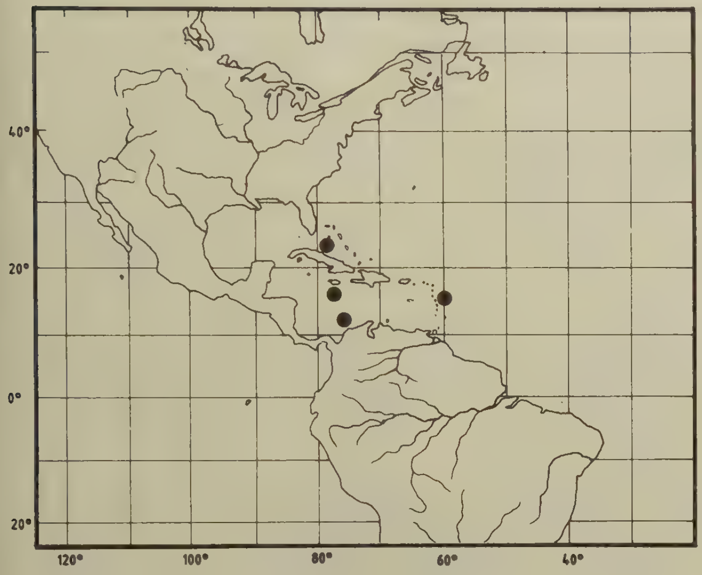


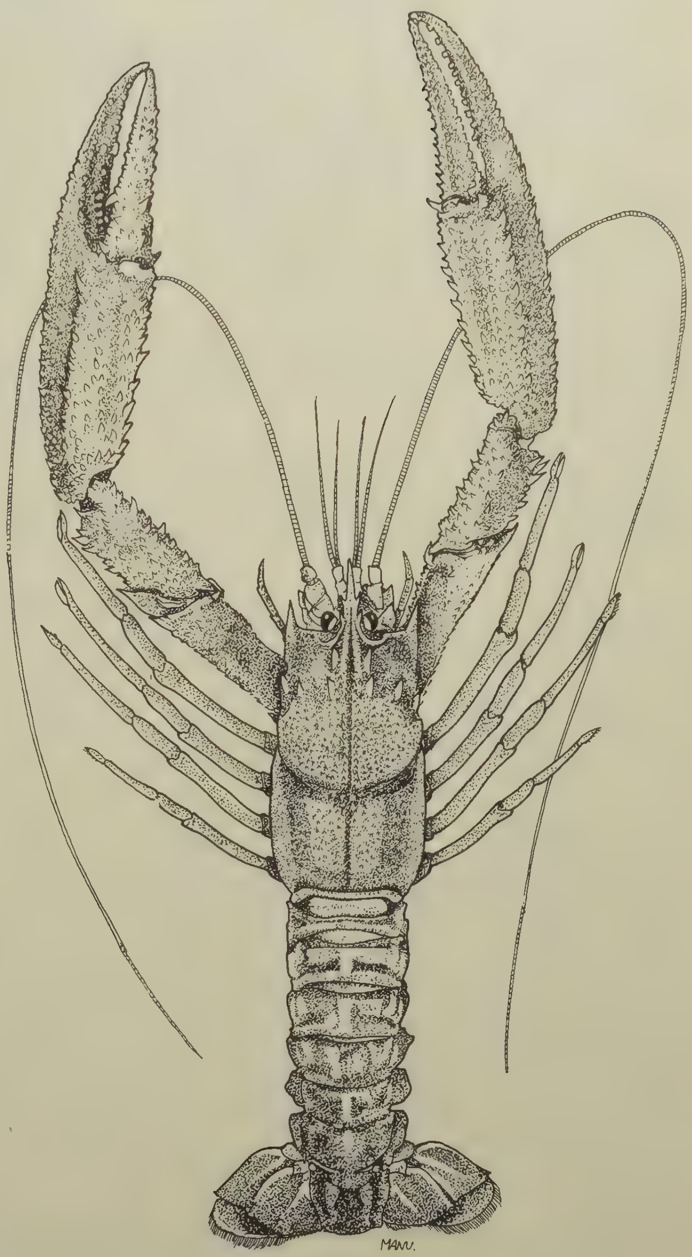
Fig. 101

Habitat and Biology : Depth range between 434 and 591 m.

Size : Maximum total body length (males) about 30 cm. Carapace length 5-14 cm (males), 4-5 cm (females).

Interest to Fisheries : The large size, that the species may attain, makes it of potential interest to fisheries. Its apparent scarcity and the fact that it inhabits great depths, however, are important obstacles.

Literature : Holthuis, 1974:849, figs 30-32.



(after Holthuis, 1974)

Fig. 100

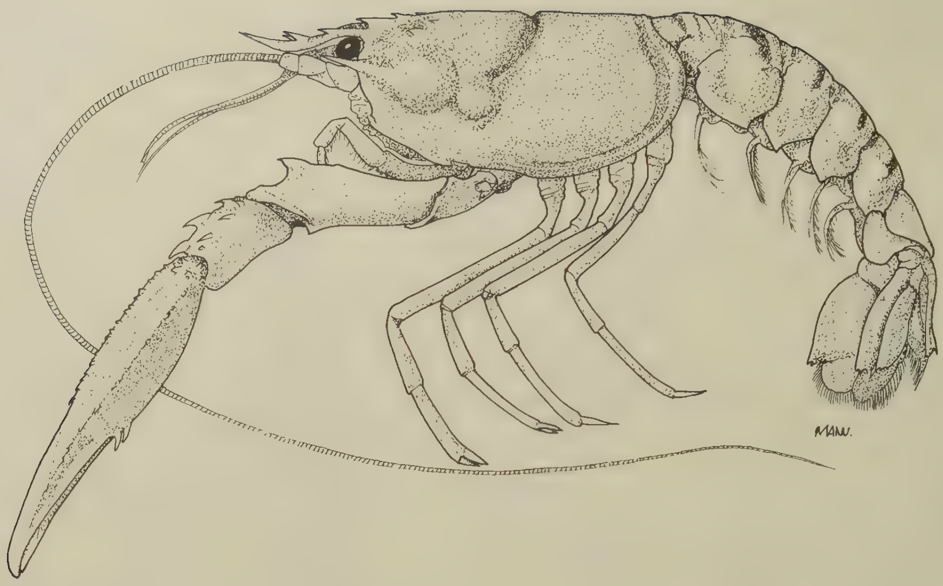
Eunephrops manningi Holthuis, 1974

Fig. 102

NEPH Euneph 3

Eunephrops manningi Holthuis, 1974, Bulletin Marine Science, University of Miami, 24(4):854, figs 33-35.

FAO Names : En - Banded lobster.



Type : Type locality: "Florida Straits, 550 m, Silver Bay stat. 2483" [= 26°25.5'N 79°01'W]. Male holotype in USNM no. 139626; paratypes in USNM, RMNH.

Geographical Distribution : Western Atlantic: Florida Straits and northwest of Anguilla (Fig. 103).

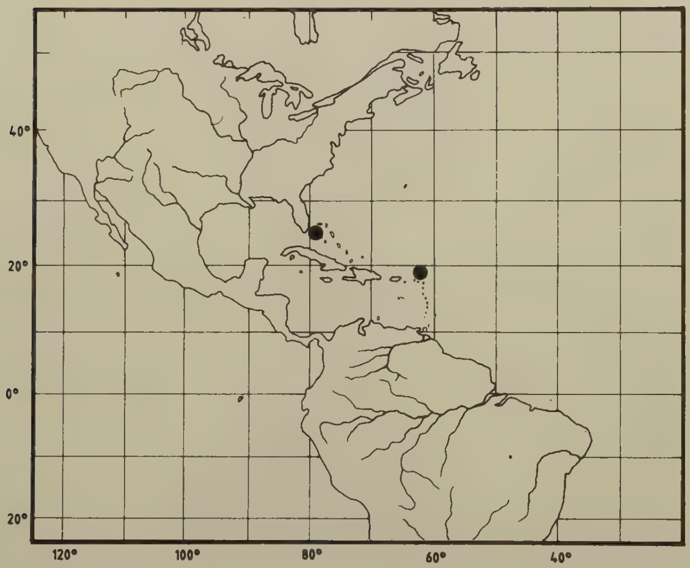


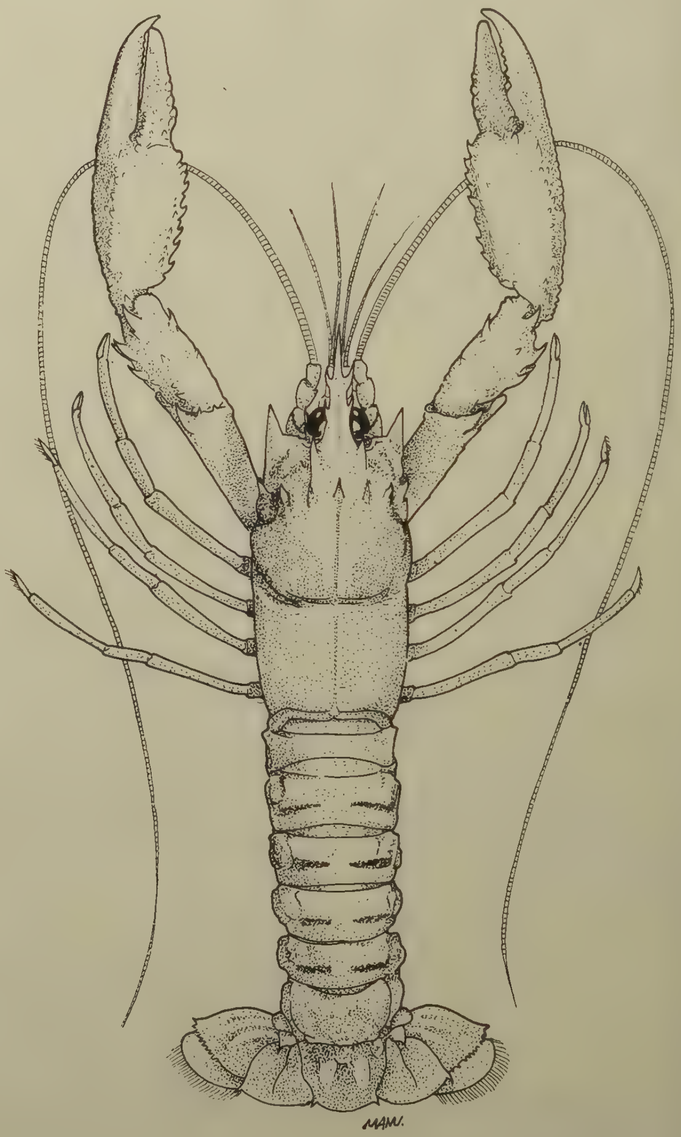
Fig. 103

Habitat and Biology : Depth range between (393-) 451 and 550 m Substrate: mud.

Size : Maximum total body length about 15 cm, carapace length 4 to 7 cm.

Interest to Fisheries : Since so far only three specimens of this species are known, nothing concrete can be said about its fisheries potential. Its size is attractive, but the depth range and low abundance are negative factors.

Literature : Original description.



(after Holthuis, 1974) Fig. 102

Homarus **Weber, 1795**

NEPH Hom

Homarus Weber, 1795, Nomenclator entomologicus: 94. Gender masculine. Name placed on the Official List of generic Names in Zoology, in Opinion 104 (published in 1928).

Type Species: selected by Fowler, 1912, Annual Report New Jersey State Museum, 1911:333: ***Astacus marinus*** Fabricius, 1775 (= ***Cancer gammarus*** Linnaeus, 1758).

Synonyms: ***Homarus*** Guérin Méneville, 1825, Encyclopédie méthodique, Histoire naturelle, Insectes, 10:768. Type species by original designation and monotypy: ***Cancer gammarus*** Linnaeus, 1758. Gender masculine.

Homarus H. Milne Edwards, 1837, Histoire naturelle des Crustacés, 2:333. Type species, selected by E. Desmarest, 1858, in Chenu, Encyclopédie Histoire naturelle (Crustacés. Mollusques. Zoophytes):38: ***Homarus vulgaris*** H. Milne Edwards, 1837. Gender masculine.

The name ***Homarus*** has been independently chosen for this genus by three different authors. Notwithstanding the fact that these three homonyms all have different nominal species as their types, they still are objectively synonymous, as these three different nominal species are objectively synonymous themselves.

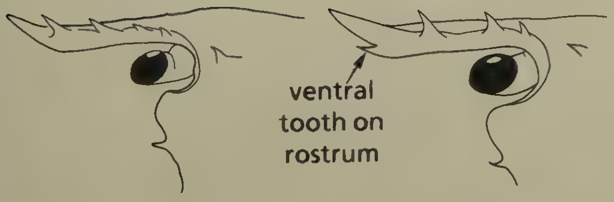
The genus ***Homarus*** has three species, two of which belong to the economically most important lobsters in the world. The importance of the genus is well expressed by Herrick (1895:6), who in his monograph "The American Lobster" stated that the lobster "may be rightfully called the King of the Crustacea".

Key to Species :

1a. Palm of first chelipeds covered with hairs, especially near the lower margin (Fig. 104a). Small species, attaining a total body length of 10 cm. Found only off South Africa south of 30°S .... ***H. capensis*** (Fig. 108)

1b. Palm of first chelipeds naked, without hair cover (Fig. 104b). Large species, attaining lengths of 40 to 65 cm. Found in the northern Atlantic, north of 30°N

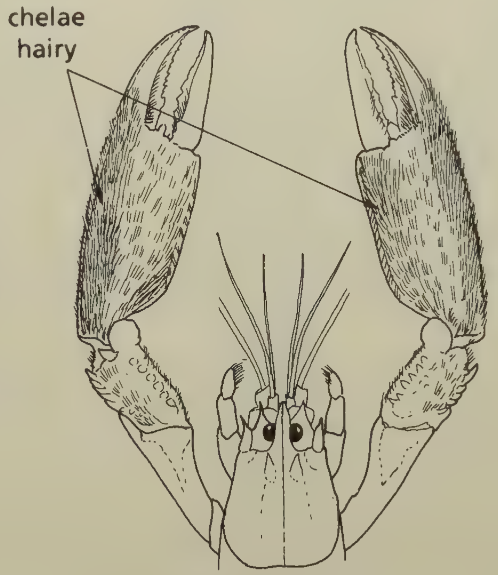
- **2a** Rostrum without ventral teeth (Fig. 105a). Found in the eastern Atlantic (Norway to Morocco) .... ***H. gammarus*** (Fig. 110)
- **2b.** Rostrum as a rule with one or more ventral teeth (Fig. 105b). Found in the western Atlantic (Newfoundland, Canada to North Carolina, USA) .... ***H. americanus*** (Fig. 106)



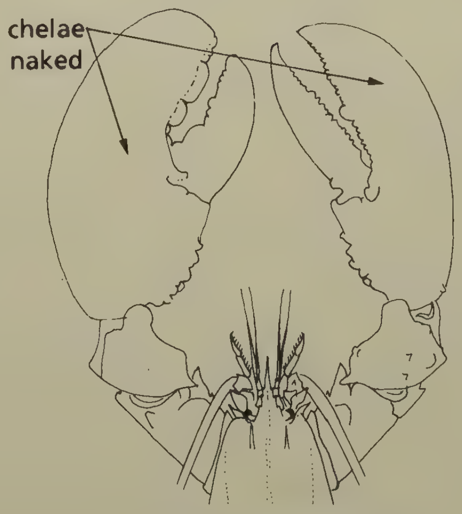
a. ***H. gammarus*** b. ***H. americanus***

front of carapace (lateral view)

Fig. 105



a. ***H. capensis***



b. ***H. americanus***

front part

Fig. 104

Homarus americanus H. Milne Edwards, 1837

NEPH Hom 2

Homarus americanus H. Milne Edwards, 1837, Histoire naturelle des Crustacés, 2:334.

Synonyms : ***Astacus marinus*** Say, 1817 (non Fabricius, 1775); ***Astacus americanus*** - Stebbing, 1893; ***Homarus mainensis*** Berrill, 1956.

FAO Names : En - American lobster; **Fr** - Homard américain; **Sp** - Bogavante americano.

Type : Type locality of ***A. marinus*** Say and ***H. americanus*** H. Milne Edwards: "Long-branch, part of the coast of New Jersey" (Say, 1817:166), USA. Lectotype, if extant, in ANSP (not located in 1989); paratype(s) in MP.

Type locality of ***H. mainensis***: "Maine waters". No types indicated.

Geographical Distribution : Western Atlantic: Atlantic coast of North America between Newfoundland (Canada) and North Carolina (USA) (Fig. 107).

Habitat and Biology : Sublittoral to 480 m depth, most common between 4 and 50 m. Hard bottom (hard mud, rocks). As the females carry their eggs for 10 to 11 months, ovigerous females are found throughout the year. Migration does not occur, or only on a limited scale.

Size : Maximum total body length 64 cm, usually around 25 cm or less. This probably is, with ***Jasus verreauxi***, the largest known Decapod species as far as body length is concerned.

Interest to Fisheries : The species is the subject of one of the most important Crustacea fisheries in the northwest Atlantic. According to FAO statistics, the catches in 1987 and 1988 amounted to 60 096 and 62 457 tons, respectively. The animals are mostly caught with traps, but in recent years trawling proved to be commercially feasible, especially in the southern part of the range of the species. These lobsters are sold fresh or frozen. The meat is also canned.

Local Names : CANADA: Lobster (English), Homard (French); USA : American lobster, Maine lobster, Northern lobster

Literature : Herrick, 1895; Herrick, 1911; Fischer (ed.), 1978:vol. 6; Williams, 1984: 168, fig. 119; Squires, 1990:326, figs 172-174.

Fig. 106

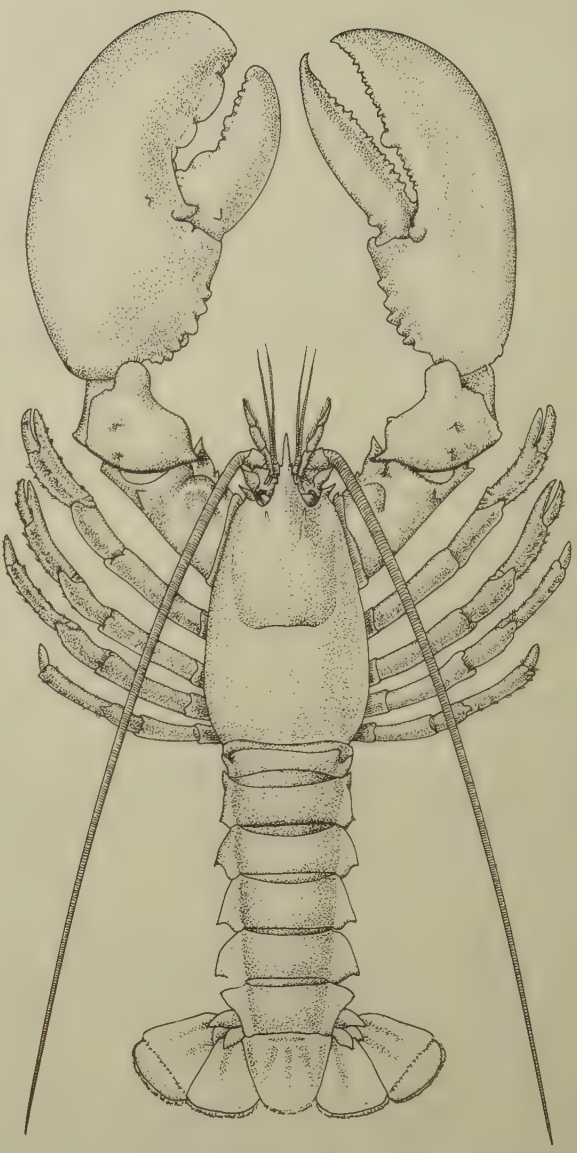


Fig. 106

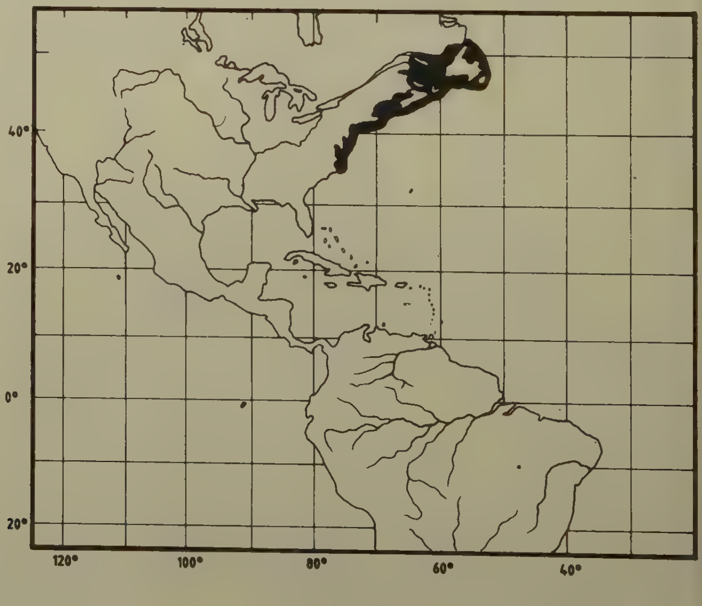


Fig. 107

Homarus capensis (Herbst, 1792)

Fig. 108

NEPH Hom 3

Cancer (Astacus) capensis Herbst, 1792, Versuch einer Naturgeschichte der Krabben und Krebse, 2:49, pl. 26 fig. 1.

Synonyms : ***Astacus fulvus*** Fabricius, 1793; ***Homarus fulvus*** - Weber, 1795; ***Astacus capensis*** - Latreille, 1802; ***Cancer (Astacus) fulvus*** - Turton, 1806.

FAO Names : En - Cape lobster; **Fr** - Homard du Cap; **Sp** - Bogavante del Cabo.

Type : Type locality of ***Cancer capensis***: "aus dem Kap" (= Cape of Good Hope, South Africa). Holotype in collection L. Spengler, Copenhagen; present whereabouts unknown, but the possibility exists that the specimen is identical with the holotype of ***Astacus fulvus*** Fabr. (see next paragraph).

Type locality of ***Astacus fulvus***: "in Oceano". Holotype (possibly also holotype of ***Cancer capensis*** Herbst) in UZM.

Geographical Distribution : South Africa, from Table Bay to East London, 33°55'S-33°06'S 18°22'E-27°49'E (Fig. 109).

Habitat and Biology : Shallow coastal waters, rock pools, etc. The extreme rarity of the species is the cause that very little is known about its habitat and biology. Old records, reporting that it is found in fresh water, are definitely incorrect.

Size : Total body length 8 to 10 cm; carapace length 4 to 5 cm.

Interest to Fisheries : None. The species is extremely rare. Although it lives in shallow water and in a well explored region of the globe (the marine fauna of South Africa is better known than that of any other African country), and although it is almost 200 years since it was first described, so far only 14 specimens (13 males and 1 female) are known to exist in collections. Gilchrist (1918:46) remarked that the species "is not even known to Cape fishermen".

Literature : Holthuis, 1986:243, fig. 1.

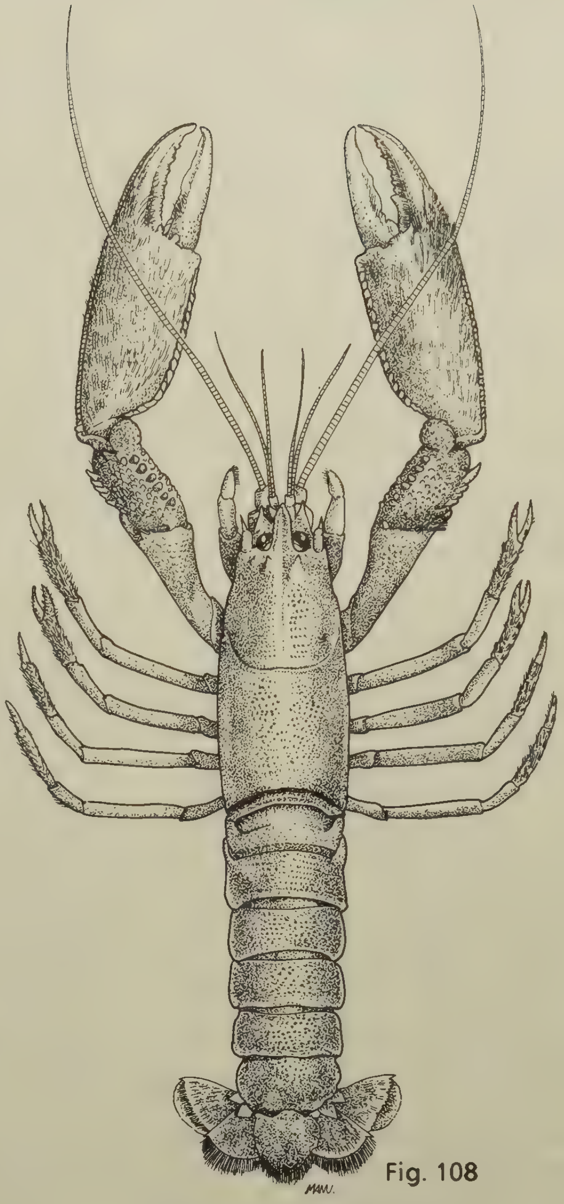


Fig. 108

(after H. Milne Edwards, 1851)

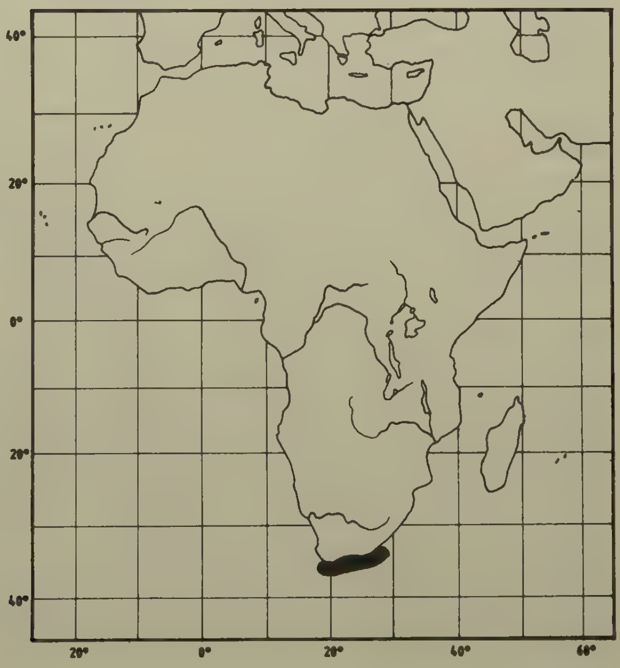


Fig. 109

Homarus gammarus (Linnaeus, 1758)

Fig. 110

NEPH Hom 1

Cancer gammarus Linnaeus, 1758, Systema Naturae, (ed.10) 1:631. Name placed on Official List of Specific Names in Zoology in Direction 51 (published in 1956).

Synonyms : ***Astacus marinus*** Fabricius, 1775; ***Astacus gammarus*** - Pennant, 1777; ***Homarus marinus*** - Weber, 1795; ***Astacus europaeus*** Couch, 1837; ***Homarus vulgaris*** H. Milne Edwards, 1837.

FAO Names : **En** - European lobster; **Fr** - Homard européen; **Sp** - Bogavante.

Type : Type locality of ***Cancer gammarus, Astacus marinus, Astacus europaeus*** and ***Homarus vulgaris***: Marstrand, west coast of Sweden, about 57°53'N 11°32'E. Lectotype selected by Holthuis (1974:820); lectotype and paralectotypes now lost.

Geographical Distribution : Eastern Atlantic from northwestern Norway (Lofoten Islands) south to the Azores and the Atlantic coast of Morocco. Also along the northwest coast of the Black Sea and in the Mediterranean (but lacking in the extreme eastern part, east of Crete). Not present in the Baltic Sea (Fig. 111).

Habitat and Biology : Continental shelf between 0 and 150 m depth; usually not deeper than 50 m. Found on hard substrates: rock or hard mud. The animals are nocturnal and territorial, living in holes or crevices. Females with eggs are found almost throughout the year. The eggs are laid around July and carried for 10 or 11 months.

Size : Maximum total body length about 60 cm (weight 5 or 6 kg), large size specimens usually 23 to 50 cm.

Interest to Fisheries : The European lobster is a highly esteemed food source and is fished throughout its range, fetching very high prices. It is mostly taken with lobster pots, although it occasionally turns up in trammel nets and dredges. Bait (usually pieces of octopus or cuttle fish) tied to lines can tempt them out of their burrows, after which they are caught by hand or with nets. In some areas captured specimens are kept alive in enclosures. The species is sold fresh, frozen or either canned or in powdered form. According to FAO statistics the annual catch of the species was 2 124 tons in 1987 and 2 052 tons in 1988 from the northeastern Atlantic (Fishing Area 27). Experiments in aquaculture of the species are underway in France and Spain.

Local Names : DENMARK: Hummer: FRANCE: Homard; GERMANY: Europäischer Hummer; GREECE: Astakós; ITALY: Astice (official name), Elefante di mare, Lupicante, Lupo di mare; MALTA: Liunfant; MONACO: Leguban; MOROCCO: Taroucht (Chleuh language); NETHERLANDS: Zeekreeft; NORWAY: Hummer; PORTUGAL: Lavagante, Labugante, Navegante; SPAIN: Bogavante (official name), Abricanto, Homar, Llangant, Lubricante; SWEDEN: Hummer; TUNISIA: Saratan il bahr; TURKEY: Istakoz, Stacoz; U.K.: Common lobster, Lobster; USSR: Omar; YUGOSLAVIA: Hlap.

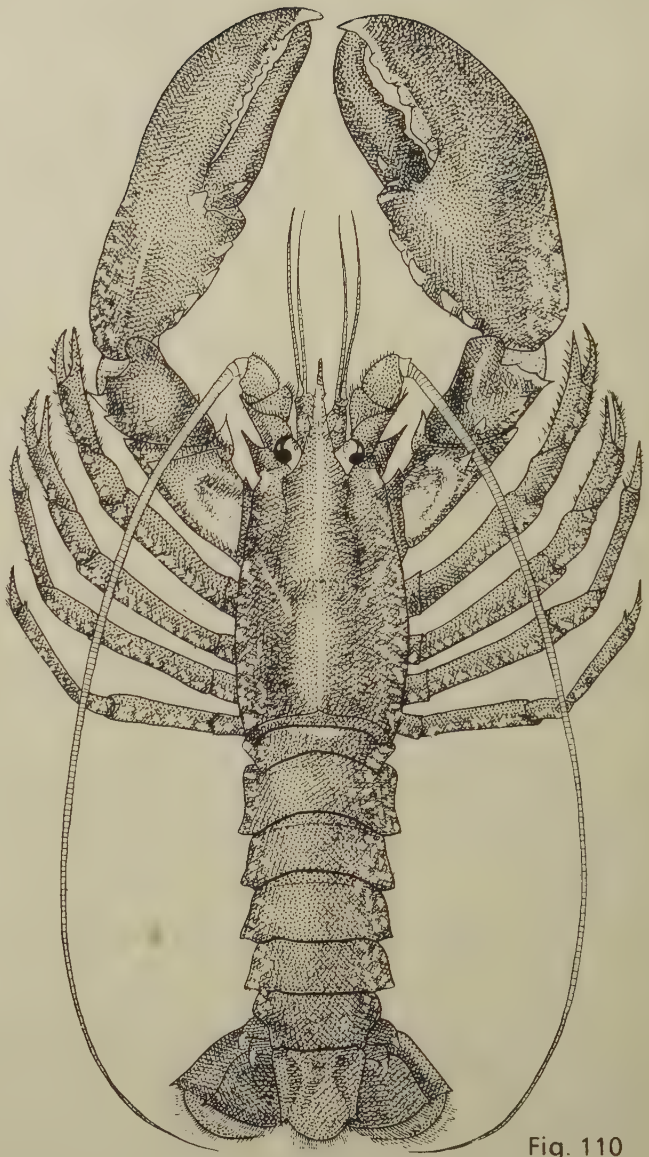


Fig. 110

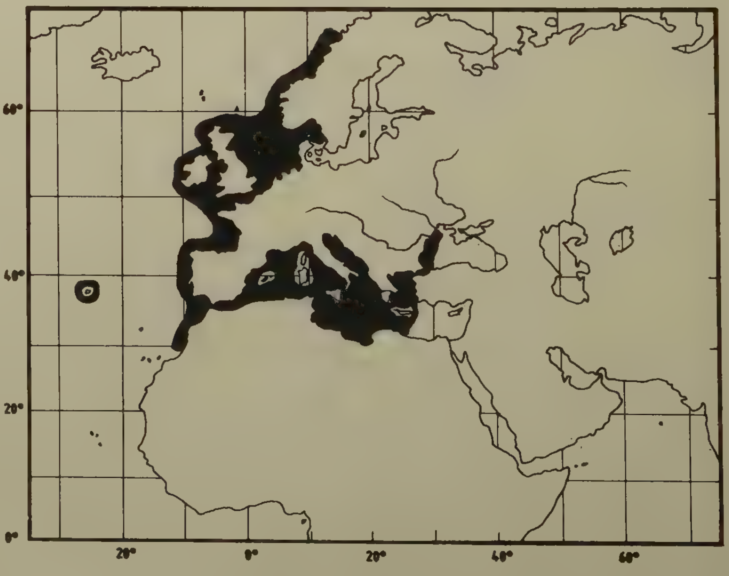


Fig. 111

Literature : Rolland, 1881:234 (local French names); Palombi & Santarelli, 1961:366,367 (local Italian names); Fischer, Bianchi & Scott (eds), 1981:vol. 5; Fischer, Bauchot & Schneider (eds), 1987:301.

Metanephrops Jenkins, 1972

NEPH Metan

Metanephrops Jenkins, 1972, Crustaceana, 22(2):161. Gender masculine.

Type Species: by original designation: ***Nephrops japonicus*** Tapparone-Canefri, 1873.

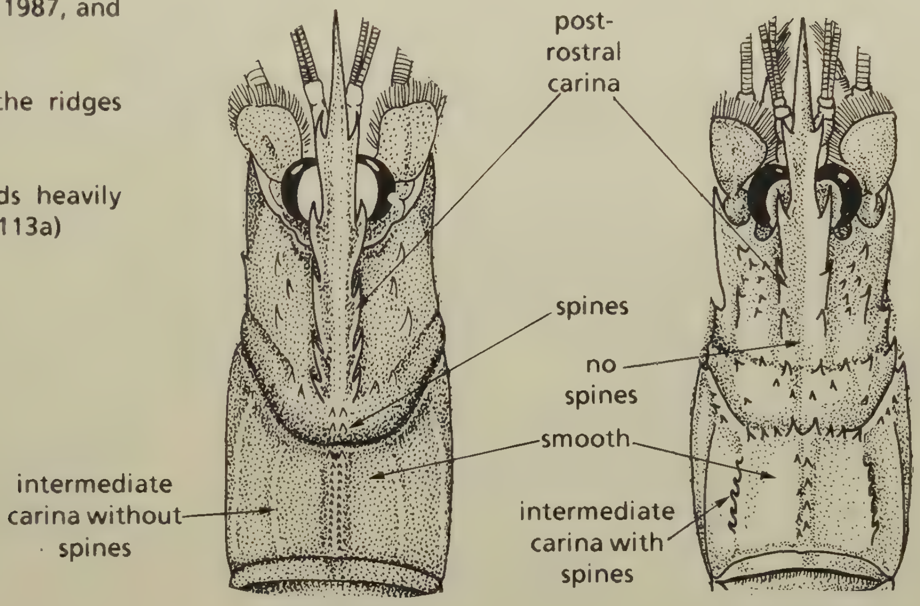
All of the tropical western Atlantic and Indo-West Pacific lobsters formerly assigned to the genus ***Nephrops***, are now placed in ***Metanephrops***. The known species of that genus now number 17, not including the fossil species.

Most of the known species are of good size and all are considered either of present or potential commercial importance and therefore, all are enumerated here.

Key to Species (after Chan & Yu, 1987, and Chan & Yu, 1991) :

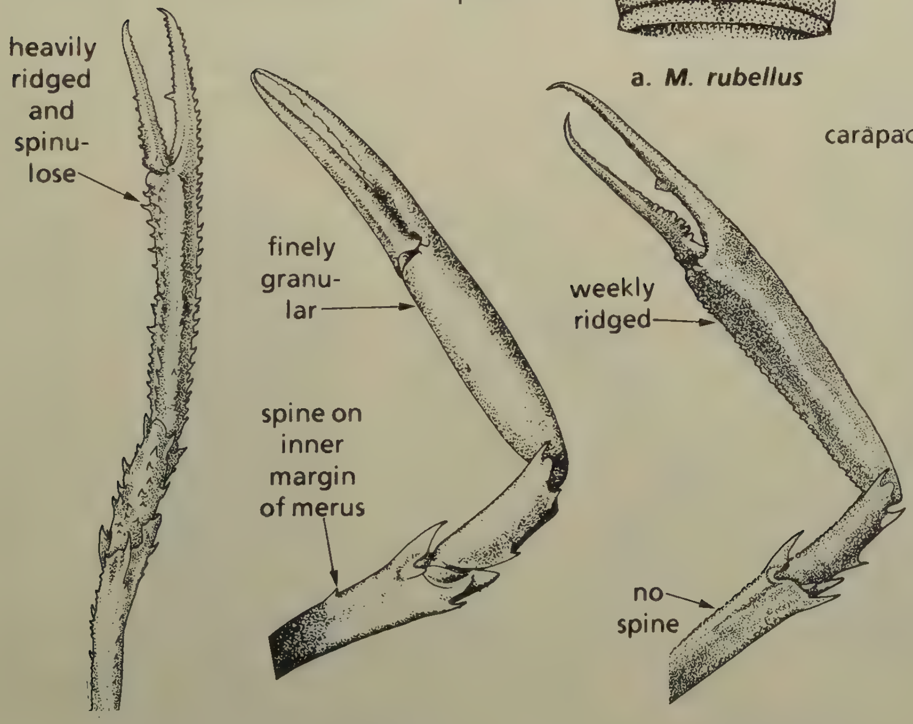
1a. Carapace smooth between the ridges and large spines (Fig. 112)

- **2a.** Chelae of first pereiopods heavily ridged and spinulose (Fig. 113a)


post-rostral carina
spines
no spines
smooth
intermediate carina without spines
intermediate carina with spines

a. ***M. rubellus*** b. ***M. binghami***

carapace (dorsal view) Fig. 112


heavily ridged and spinulose
finely granular
spine on inner margin of merus
weekly ridged
no spine

a.***M. binghami*** b. ***M. boschmai*** c. ***M. sibogae***

first pereiopod Fig. 113

3a. Surface of abdominal tergites smooth (Fig. 114). Western Atlantic .... ("*binghami*" group)

4a. Spinules present behind postrostral carinae. Intermediate carina smooth (Fig. 112a). S.W. Atlantic .... ***M. rubellus*** (Fig. 150)

4b. Spinules absent behind postrostral carinae. Intermediate carina spinulose (Fig. 112b). West Indian region .... ***M. binghami*** (Fig. 136)

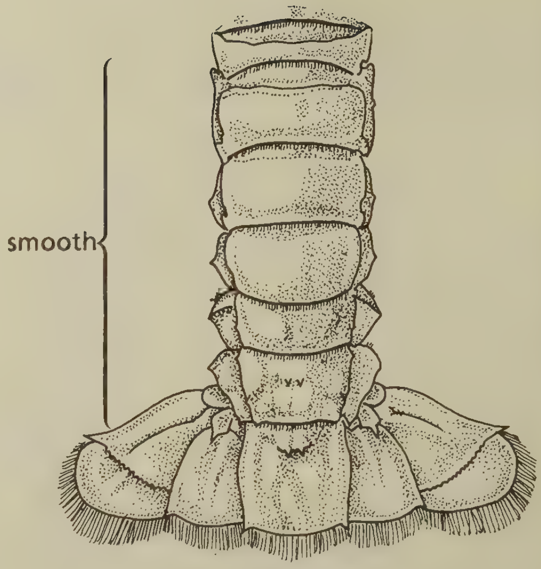
3b. Surface of abdominal tergites conspicuously sculptured (Fig. 115). Indo-West Pacific .... ("*japonicus*" group)

5a. Fifth abdominal somite with a distinct spine on the carina that separates the tergite from the pleuron. Dorsomedian carina of sixth abdominal somite with one or two pairs of submedian spines (Figs 116, 117). A prominent basal spine on outer edge of movable finger of large chela (Fig. 120a).

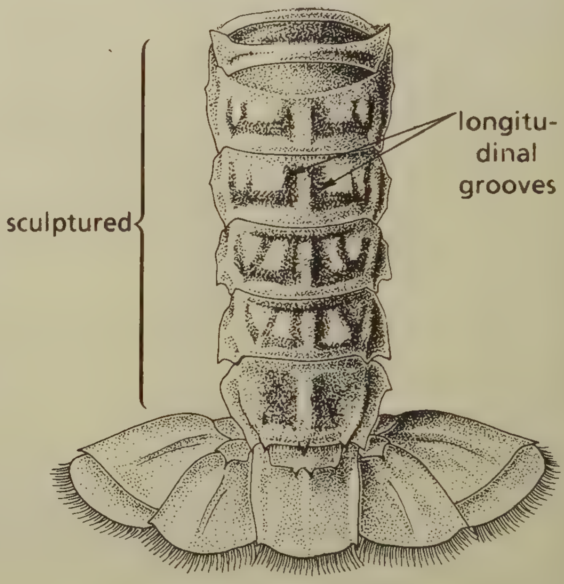
6a. Raised portions of dorsal surface of abdomen subdivided. First abdominal somite with a dorsomedian carina (Fig. 116) (Japan) ... ***M. japonicus*** (Fig. 144)

6b. Raised parts of dorsal surface of abdomen smooth, not subdivided. No raised dorsomedian carina on first abdominal somite (Fig. 117) (Taiwan) .... ***M. armatus*** (Fig. 132)

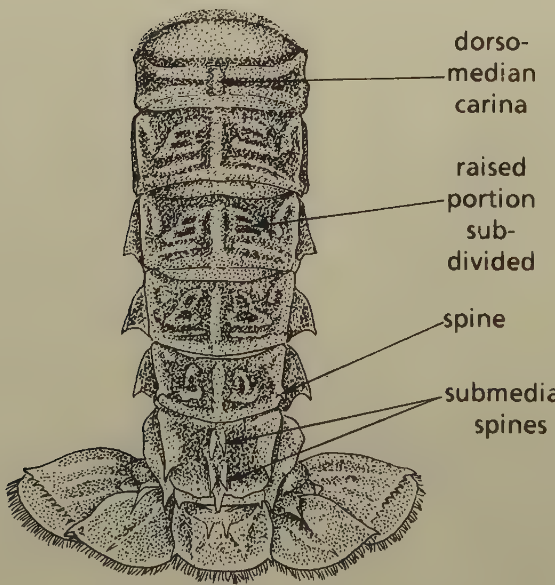
5b. Fifth abdominal somite without distinct spines on carina separating tergite from pleuron. Dorsomedian carina of sixth abdominal somite without submedian spines.



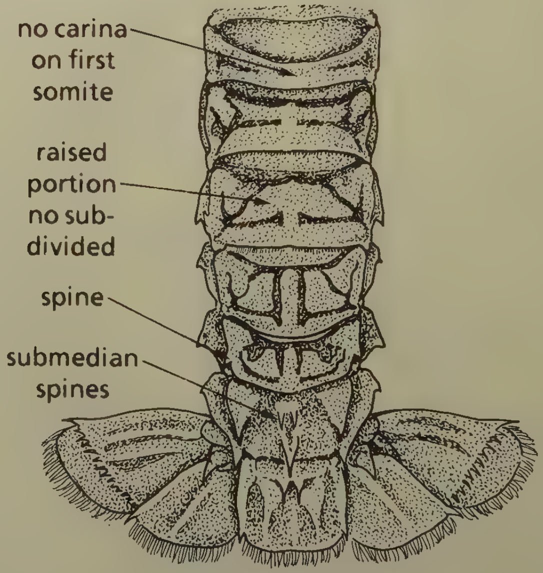
M. binghami
abdomen (dorsal view) Fig. 114


longitudinal grooves
sculptured

M. andamanicus
abdomen (dorsal view) Fig. 115


dorsomedian carina
raised portion subdivided
spine
submedian spines

M. japonicus
abdomen (dorsal view)
Fig. 116


no carina on first somite
raised portion no subdivided
spine
submedian spines

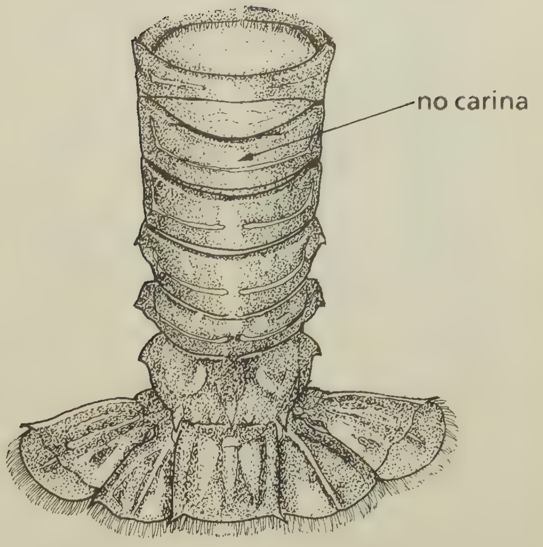
M. armatus
abdomen (dorsal view) Fig. 117

7a. Chela of first pereiopod with large spines. A prominent basal spine on outer edge of movable finger of large chela (Fig. 120a). Abdomen without dorsomedian carina (Fig. 118) (Taiwan) .... ***M. formosanus*** (Fig. 142)

7b. Chela of first pereiopod without large spines. No prominent basal spine on outer edge of movable finger of large chela (Fig. 120b,c) Abdomen with dorsomedian carina

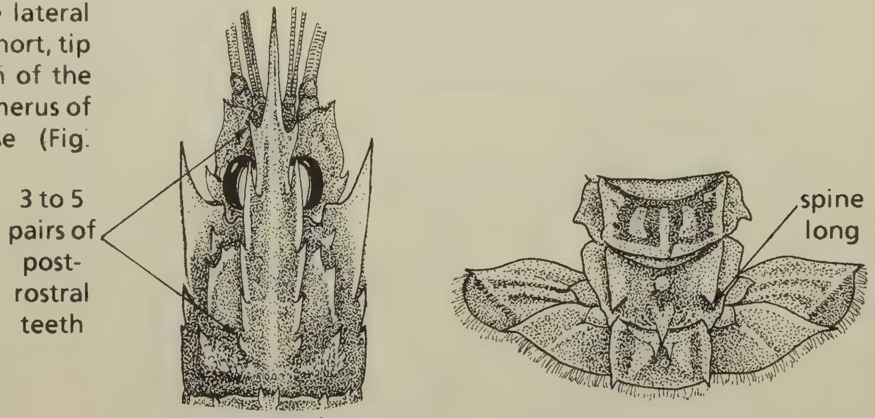
8a. Postrostral carinae with 3 to 5 (rarely 3) teeth (119a). Spine in the middle of the lateral margin of sixth abdominal somite long, reaching to posterolateral groove of the somite (119b). Inner margin of merus of first pereiopod heavily spinulose (Fig. 120b) (Japan, Taiwan) ...... ***M. sagamiensis*** (Fig. 152)

8b. Postrostral carinae with never more than 3 teeth. Spine in the middle of the lateral margin of sixth abdominal somite short, tip far from the posterolateral margin of the somite (Fig. 121). Inner margin of merus of first pereiopod weakly spinulose (Fig. 120c).



M. formosanus
abdomen (dorsal view)

Fig. 118

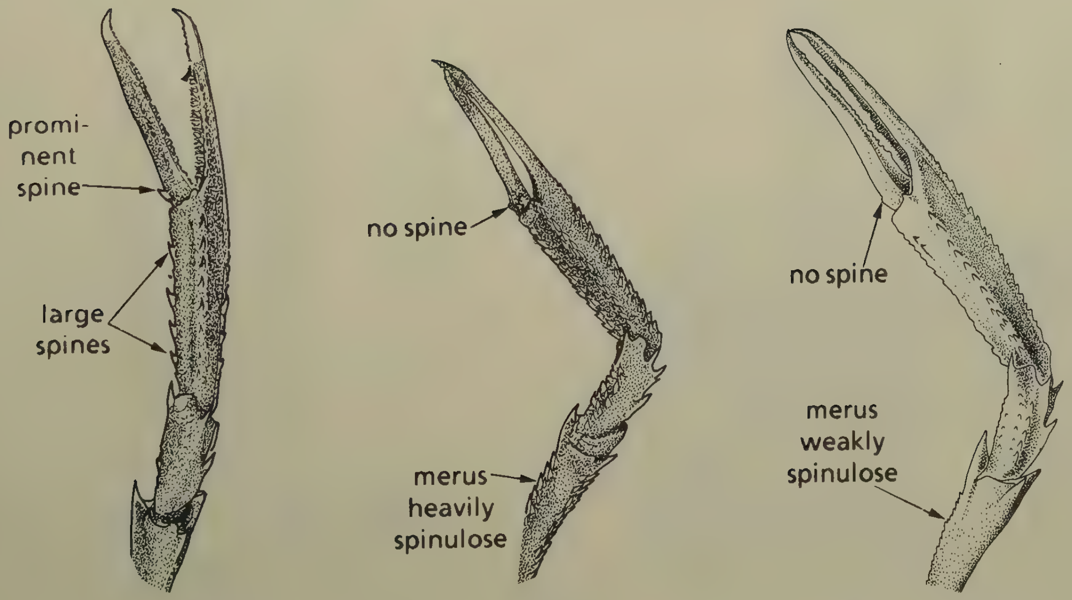

3 to 5 pairs of post-rostral teeth
spine long

a. anterior part of carapace (dorsal view)

b. last two abdominal somites (dorsal view)

M. sagamiensis

Fig. 119


promi-nent spine
large spines
no spine
merus heavily spinulose
no spine
merus weakly spinulose

a. ***M. formosanus***

b. ***M. sagamiensis***

c. ***M. andamanicus***

first pereiopod

Fig. 120

9a. Raised parts of the abdominal somites coarse and pubescent (Fig. 121) (Philippines, W. Australia) .... ***M. velutinus*** (Fig. 160)

9b Raised parts of dorsal surface of abdominal somites smooth and naked (Fig. 122)

10a. Second to fifth abdominal somites with marked dorsomedian carina, flanked by a pair of conspicuous longitudinal grooves (Fig. 115). Indian Ocean, South China Sea .... ***M. andamanicus*** (Fig. 128)

10b. Dorsomedian carina of abdomen almost level with the dorsal surface of the somite, without grooves at either side (Fig. 122). S.E. Africa, Madagascar .. ***M. mozambicus*** (Fig. 146)

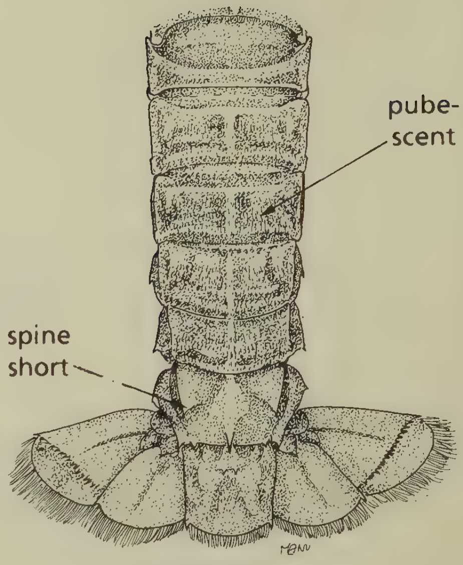
2b. Chelae of first pereiopods weakly ridged and finely granular (Fig. 113b,c). Indo-West Pacific .... (*"thomsoni"* group)

11a. Transverse grooves present on abdominal tergites 2 to 5

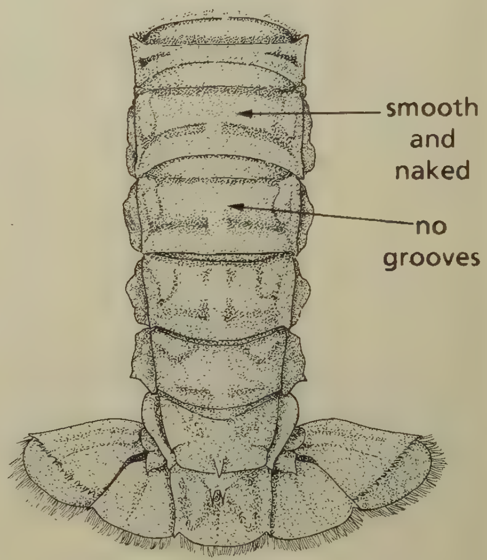
12a. No transverse groove present on first tergite (Fig. 123) (Japan, China, Philippines) .... ***M. thomsoni*** Fig. 158)

12b. Transverse groove present on first tergite (Fig. 124). S. China Sea .... ***M. sinensis*** (Fig. 156)

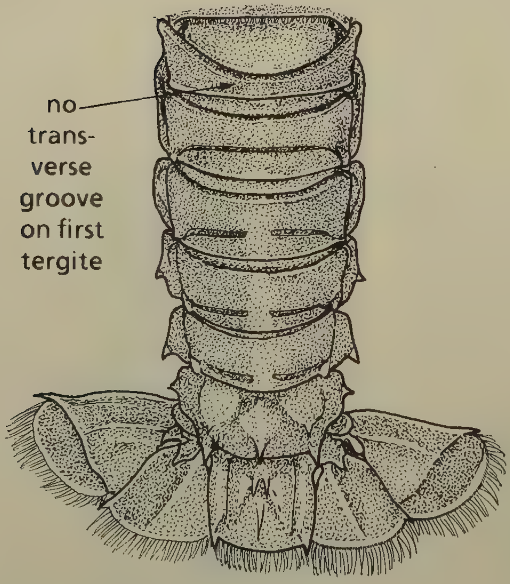
11b. Transverse grooves absent from abdominal tergites 2 to 5


pube-
scent
spine
short

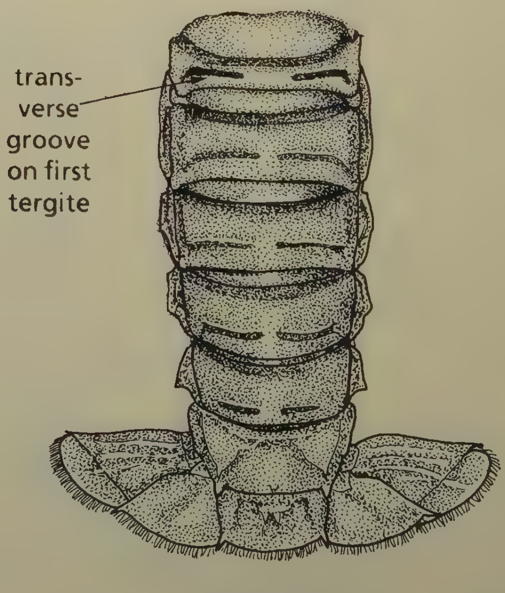
M. velutinus
abdomen (dorsal view) Fig. 121


smooth
and
naked
no
grooves

M. mozambicus
abdomen (dorsal view) Fig. 122


no
trans-
verse
groove
on first
tergite

M. thomsoni
abdomen (dorsal view)
Fig. 123


trans-
verse
groove
on first
tergite

M. sinensis
abdomen (dorsal view) Fig. 124

13a. Longitudinal spinulose cardiac ridge absent (Fig. 125a) (New Zealand) .... ***M. challengeri*** (Fig. 140)

13b. Longitudinal spinulose cardiac ridge present (Fig. 125b)

14a. Distinct spine present in the middle of inner margin of merus of first pereiopod (Fig. 113b) (Australia) . ***M. boschmai*** (Fig. 138)

14b. No distinct spine present in the middle of inner margin of merus of first pereiopod (Fig. 113c) (Indonesia, Australia) .... ***M. sibogae*** (Fig. 154)

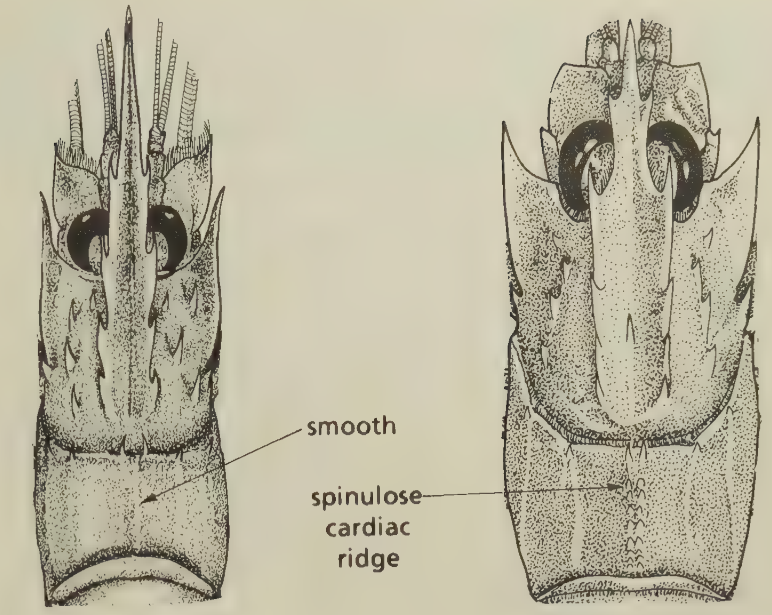
1b. Carapace rather uniformly spinulose (Fig. 126a,b) .... ("***arafurensis***" group)

15a. Region between postrostral carinae heavily spinulose (Fig. 126a). S. China Sea, Australia .. ***M. neptunus*** (Fig. 148)

15b. Region between postrostral carinae smooth (Fig. 126b)

16a. Longitudinal furrows present on abdominal tergites (Fig. 127a) .... ***M. arafurensis*** (Fig. 130)

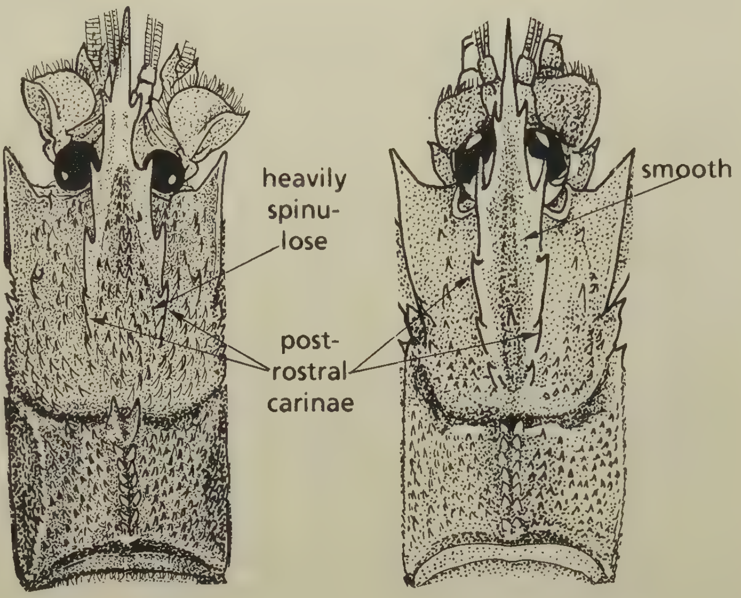
16b. Longitudinal furrows absent from abdominal tergites (Fig. 127b) .... ***M. australiensis*** (Fig. 134)



a. ***M. challengeri*** **b.** ***M. sibogae***

carapace (dorsal view)

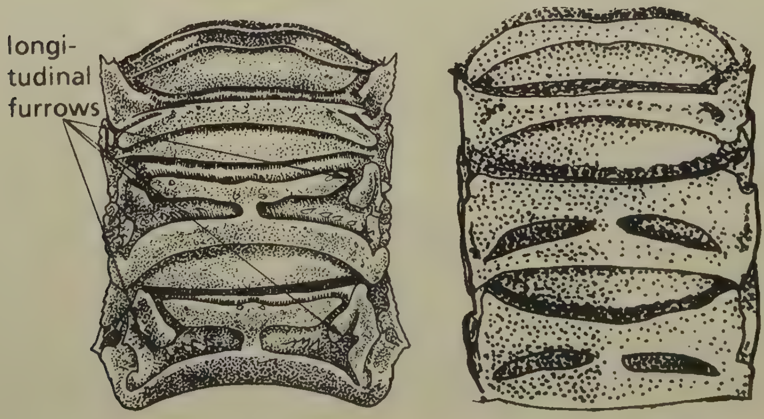
Fig. 125



a. ***M. neptunus*** **b.** ***M. australiensis***

carapace (dorsal view)

Fig. 126



a. ***M. arafurensis*** **b.** ***M. australiensis***

first three abdominal somites

Fig. 127

Metanephrops andamanicus (Wood-Mason, 1891)

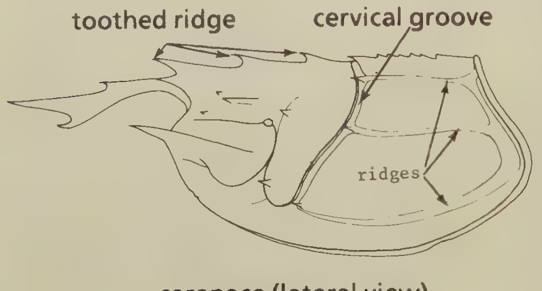
Fig. 128

NEPH Metan 2

Nephrops andamanicus Wood-Mason, 1891, Illustrations of the Zoology of H.M.S. Investigator, Crust. 1:pl. 4.

Synonyms : ***Nephrops thomsoni andamanicus*** - Alcock, 1901.

FAO Names : En - Andaman lobster; **Fr** - Langoustine andamane; **Sp** - Cigala de Andamán.



carapace (lateral view)

Type : Type locality: "Investigator" Station 115, Andaman Sea, 11°31'40"N 92°46'40"E; 188-220 fathoms (= 344-402 m), green mud. Holotype male in ZSI, no. 5812/10, in alcohol, condition poor (not labelled as type).

Geographical Distribution : Indo-West Pacific region: East Africa, the Andaman Sea, the South China Sea, and Indonesia(Fig. 128). Records of ***M. andamanicus*** from S.E. Africa and Madagascar pertain to ***M. mozambicus***, those from Australia to ***M. velutinus***. A record from Madang, Papua New Guinea (King, 1988:109) needs verification.

Habitat and Biology : Depth range from 250 to 750 m, but mostly between 300 and 450 m. Substrate of hard mud; the species possibly lives in burrows.

Size : Total body length up to 20 cm, most common between 15 and 18 cm; carapace length about 4.5 to 6 cm.

Interest to Fisheries : Longhurst (1970:286) mentioned the species as a potential fishery resource off Hong Kong. It is well possible that the same is true in other parts of its range. Its size and the fact that the species lives on trawlable bottoms are in favour of this supposition. Records of commercial catches of ***M. andamanicus*** off S.E. Africa and Madagascar refer to ***M. mozambicus***; such records from Australia are actually based on material of ***M. velutinus***.

Literature : Fischer & Bianchi (eds), 1984: vol. 5; Chan & Yu, 1991:32, pls 2a,c, 4a,c, 6a, 7d.

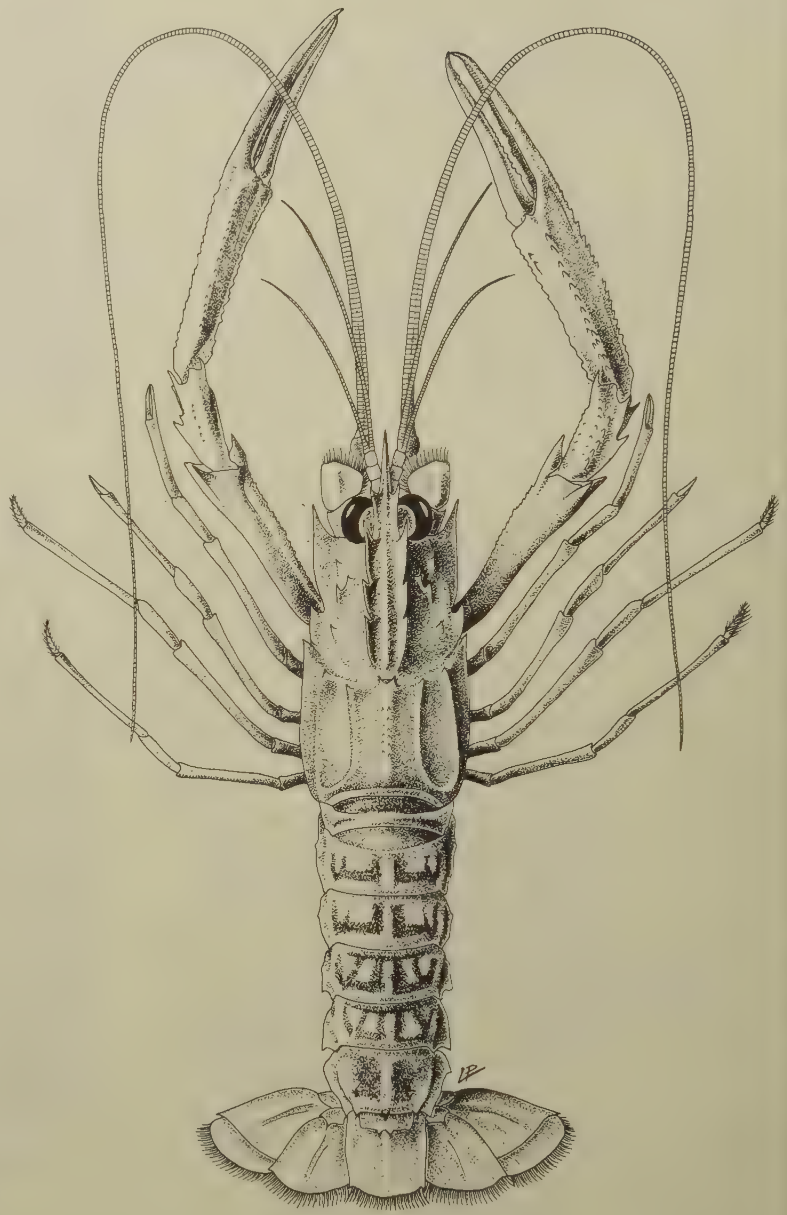


Fig. 127

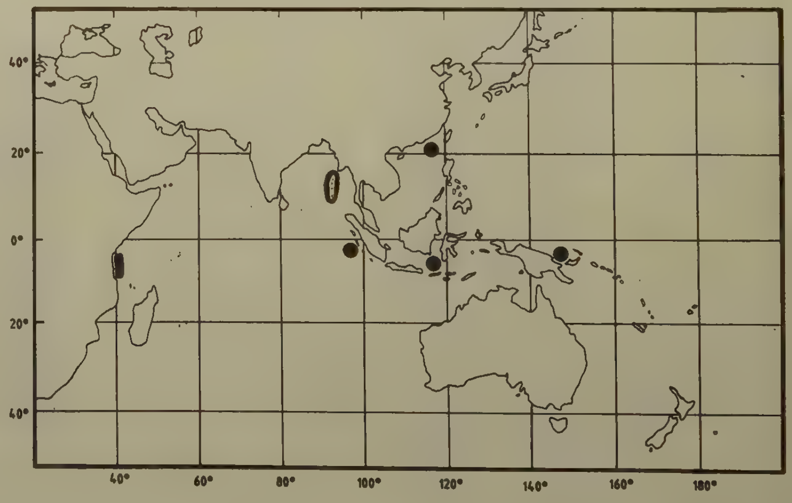


Fig. 128

Metanephrops arafurensis (De Man, 1905)

Fig. 130

NEPH Metan 3

Nephrops arafurensis De Man, 1905, Tijdschrift Nederlandsche Dierkundige Vereeniging, (2)9:587.

FAO Names : **En** - Arafura lobster.

Type : Type locality: Arafura Sea, Indonesia, "Siboga" Expedition "Station 262. Lat. 5°53.8'S., long. 132°48.8'E. Depth 560 M". Only known from mutilated holotype male in ZMA, no. DE 102.670, condition fair, apart from the original damage.

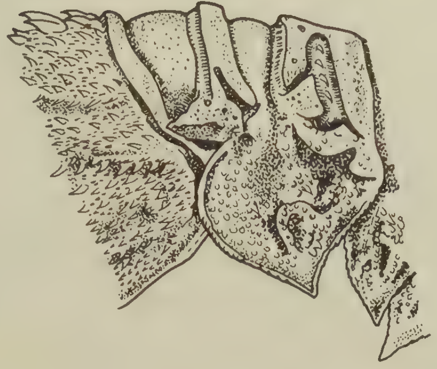
Geographical Distribution : Indo-West Pacific region: Indonesia; only known from type locality (Fig. 131).

Habitat and Biology : Found at 560 m depth; bottom solid bluish grey mud overlaid by softer brown mud.

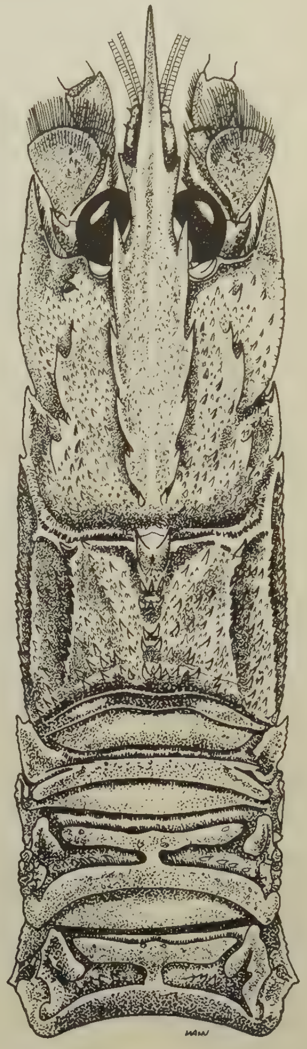
Size: Carapace length; including rostrum, 5.5 cm; total body length about 12 cm.

Interest to Fisheries : As the species is known only from a single specimen, nothing can be said about its potential commercial value.

Literature : De Man, 1916:107, pl. 3 fig. 16.



first two abdominal somites
(lateral view)



carapace and first three abdominal somites

(after De Man, 1916) Fig. 130

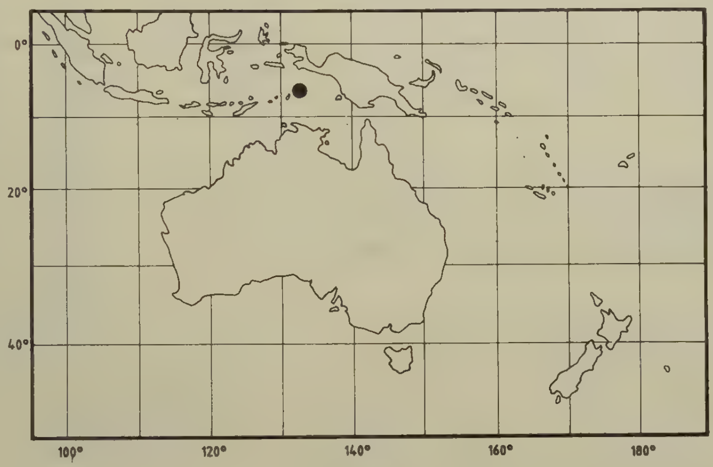


Fig. 131

Metanephrops armatus Chan & Yu, 1991

Fig. 132

NEPH Metan 15

Metanephrops armatus Chan & Yu, 1991, Crustaceana, 60(1):25, pls 1b, 3b, 5b,d, 7b, 9a,b.

FAO Names : **En** - Armoured lobster.

Type : Type locality: "north-eastern Taiwan, Su-Ao, I-Lan County ... fish market, 300-400 m (from fishermen)". Holotype male, NTOU no. 90-3-9H. Paratypes, NTOU, RMNH, TFRI. All type material in good condition, in alcohol.

Geographical Distribution : Indo-West Pacific region: off north-east and south-west Taiwan (Fig. 133).

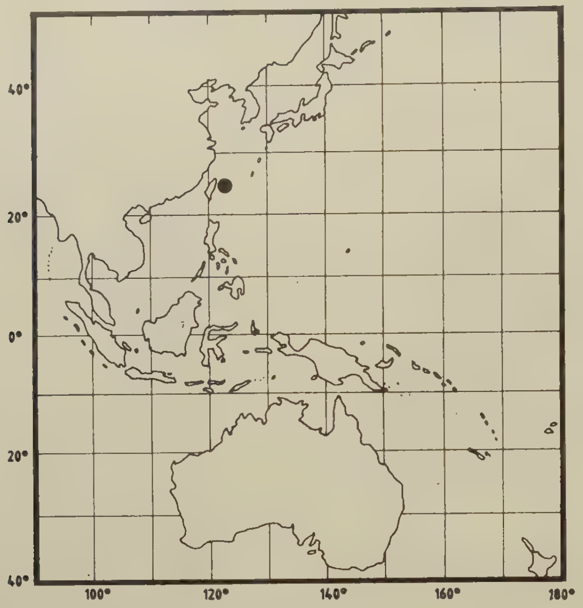


Fig. 133

Habitat and Biology : At depths of 200 to 450 m, mostly more than 300 m. On a more rocky bottom than the other Taiwan lobsters.

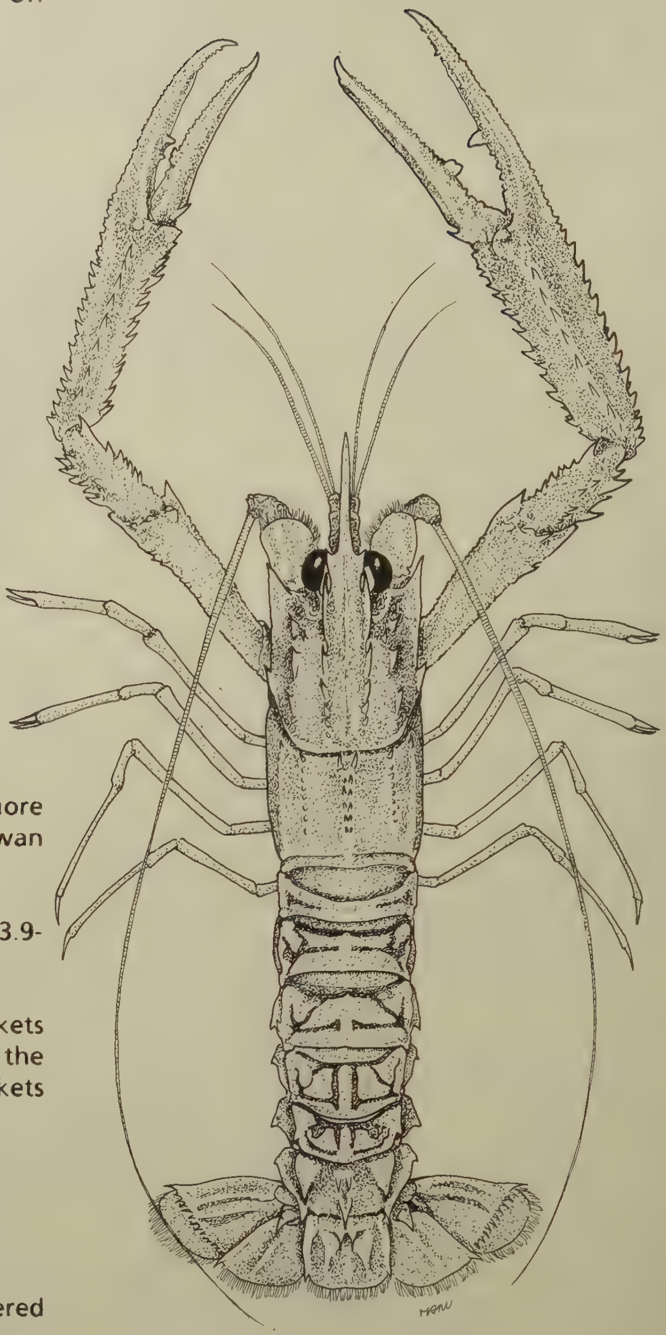
Size: Carapace length 1.7-5.7 cm (males), 1.4-4.8 (females), 3.9-4.4 cm (ovigerous females).

Interest to Fisheries : The species is sold on the Taiwan markets and fetches better prices than the other Taiwan lobsters as the specimens are larger. However, it is less common in the markets than the other species.

Local Names : TAIWAN: Armoured lobster.

Literature : Original description.

Remarks: Before 1991 specimens of this species were considered to belong to ***M. japonicus.***



(after Chan & Yu, 1991)

Fig. 132

Metanephrops australiensis (Bruce, 1966)

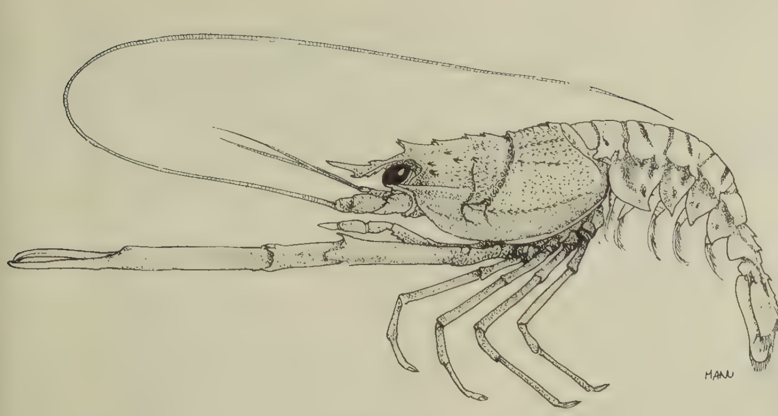
Fig. 134

NEPH Metan 4

Nephrops australiensis Bruce, 1966, Crustaceana, 10:245, pls 25-27.

FAO Names : **En** - Northwest lobster.

Type : Type locality: "N.E. of Port Hedland, northern Western Australia, approximately 8.5 miles east of Mermaid Reef, 17°05'S 119°48'E; depth 434 metres". Holotype male in WAM (no. 11-64).



(after Bruce, 1966) lateral view

Geographical Distribution : Indo-West Pacific region. So far the species has only been found off the northwest coast of Western Australia near Port Hedland, at 17°05'S 119°48'E and 18°26'S 117°34'E (Fig. 135).

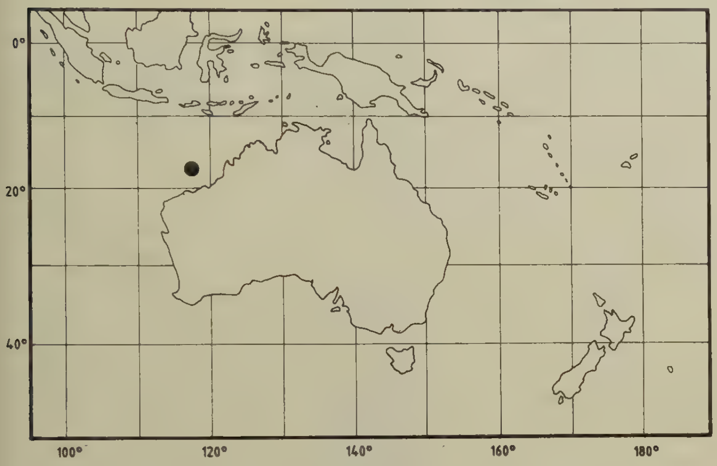
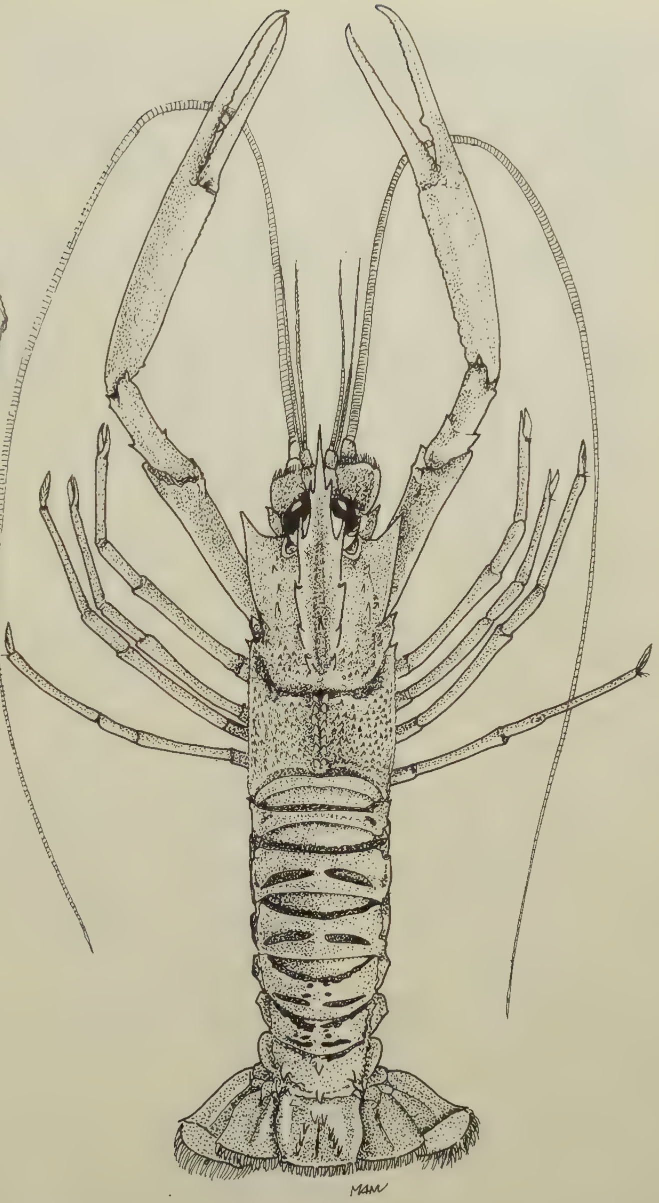


Fig. 135



(after Bruce, 1966) dorsal view Fig. 134

Habitat and Biology : Depth range from 418 to 500 m, on a bottom of ***Globigerina*** ooze.

Size : Total body length to 18 cm; carapace length 4 to 7 cm, average 5 cm.

Interest to Fisheries : Potential. At the type locality, 39 specimens were obtained by trawl in a single haul. Proper equipment and better knowledge of its occurrence, habitat and habits may show the species to be of economic interest. George (1983:16) counted this species among the 5 of which off Port Hedland the "commercial prospects ... are probably the most encouraging". Wallner & Phillips (1988:36) indicated that off N.W. Australia, 38% of the ***Metanephrops*** catch was formed by this species. In 1984, Davis & Ward (1984:42) gave the catch percentages by weight of the trawling off northwest Australia as follows: 50% shrimps, 32.5% ***M. australiensis***, 12.1% ***M. velutinus***, and 5.4% ***M. boschmai***.

Local Names : AUSTRALIA: Northwest scampi.

Literature : Original description.

Metanephrops binghami (Boone, 1927)

Fig. 136

NEPH Metan 1

Nephrops binghami Boone, 1927, Bulletin Bingham Oceanographic Collection, 1(2):91, figs 18-20.

FAO Names : **En** - Caribbean lobster; **Fr** - Langoustine caraibe; **Sp** - Cigala del Caribe.

Type : Type locality: "from north to Glover Reef, in 484 fathoms of water". The exact type locality and depth are not certain (see Holthuis, 1974:835), but it probably is 16°49'38"N 87°58'15"W, 384 fms [=703 m]. Holotype male in YPM, no. 4380; 4 paratypes in YPM, nos. 4381-4384 (all type material in alcohol and in excellent condition).

Geographical Distribution : Western Atlantic region: from the Bahama Islands and southern Florida (USA) to French Guiana, including the Gulf of Mexico and the Caribbean Sea (Fig. 137).

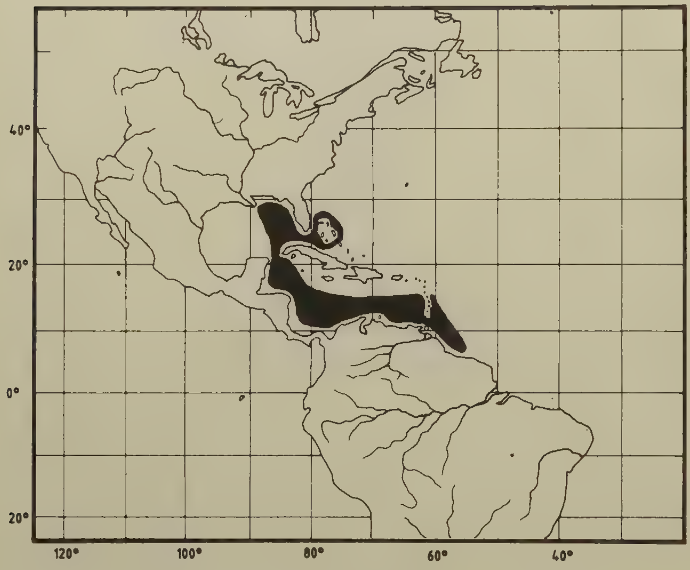
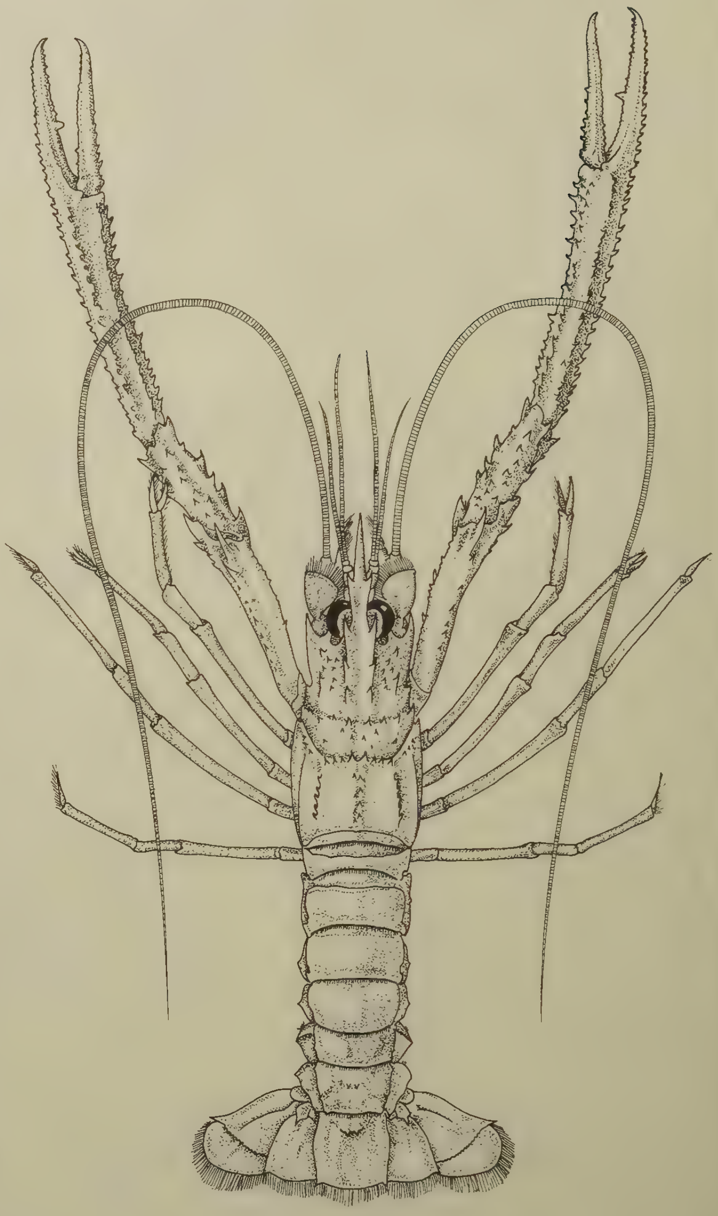


Fig. 137



(after Boone, 1927)

Fig. 136

Habitat and Biology : Depth range from 230 to 700 m, most common between 300 and 500 m; on a substrate of sand or mud.

Size : Total body length to 17 cm, usually around 12 cm.

Interest to Fisheries : The species is not actively fished for at present, but it was taken in commercially attractive quantities during exploratory trawling operations in the western Caribbean Sea (about 10 kg/h).

Local Names : USA: Caribbean lobsterette.

Literature : Holthuis, 1974:827, figs 25,26; Fischer (ed.), 1978:vol. 6.

Metanephrops boschmai (Holthuis, 1964)

Fig. 138

NEPH Metan 5

Nephrops boschmai Holthuis, 1964, Zoologische Mededelingen Leiden, 39: 72, fig. 1.

FAO Names : En - Bight lobster.

Type : Type locality: "Great Australian Bight, 126.5°E, S. W. of Eucla, 130-190 fathoms [=238-348 m]". Holotype male in AMS, no. E3673 (a female paratype under the same number); paratypes in AMS, USNM, RMNH.

Geographical Distribution : Indo-West Pacific region: off the west and south coasts of Western Australia from Port Hedland to Eucla (Fig. 139).

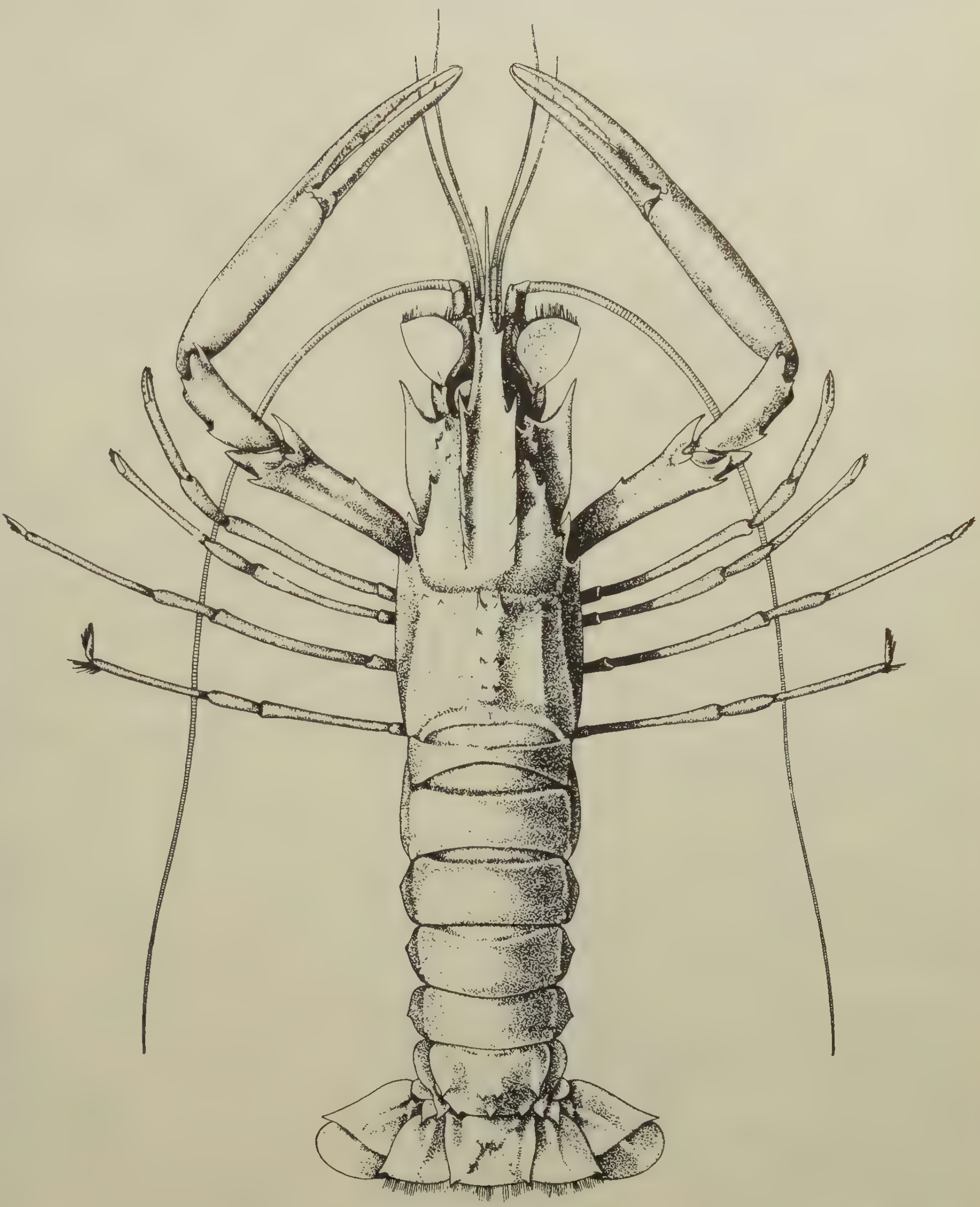
Habitat and Biology : Depth range from 300 to 460 m; on substrates of mud, or mud and rubble.

Size : Total body length to 18 cm; carapace length about 3 to 5 cm.

Interest to Fisheries : George (1983:17) observed that off Port Hedland, Western Australia, the commercial prospects of the 4 species of ***Metanephrops*** and one of ***Puerulus*** occurring there "are probably the most encouraging" and that of the 4 ***Metanephrops*** species, ***M. boschmai*** is there the most common one. Wallner & Phillips (1988:36) remarked that off north-west Australia "***M. boschmai***, which is smaller [than ***M. velutinus*** and ***M. australiensis***] and therefore less marketable, has not been exploited to any extent" More exploration remains necessary.

Local Names : AUSTRALIA: Bight scampi; Boschma's scampi.

Literature : Original description.



(from Holthuis, 1964)

Fig. 138

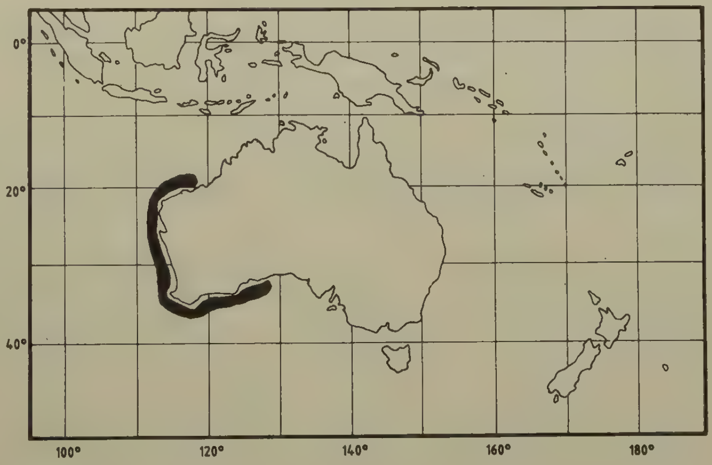


Fig. 139

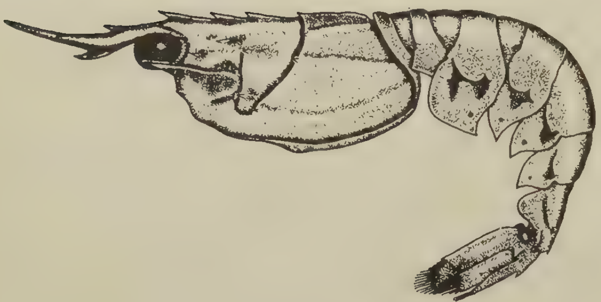
Metanephrops challengeri (Balss, 1914)

Fig. 140

NEPH Metan 6

Nephrops challengeri Balss, 1914, Abhandlungen Bayerischen Akademie Wissenschaften (mathematisch-physikalische Klasse), (suppl.2)10:84.

FAO Names : **En** - New Zealand lobster.



lateral view (from Yaldwyn, 1954)

Type : Type locality: "Challenger" Station 166, between Australia and New Zealand, 38°50'S 169°20'E, 275 fathoms [= 503 m], bottom ***Globigerina*** ooze. Two syntype females in BM, no. 88.22 (in alcohol, condition good).

Geographical Distribution : Indo-West Pacific region. New Zealand waters: continental shelf around both North and South Islands as far east as Chatham Islands (Fig. 141).

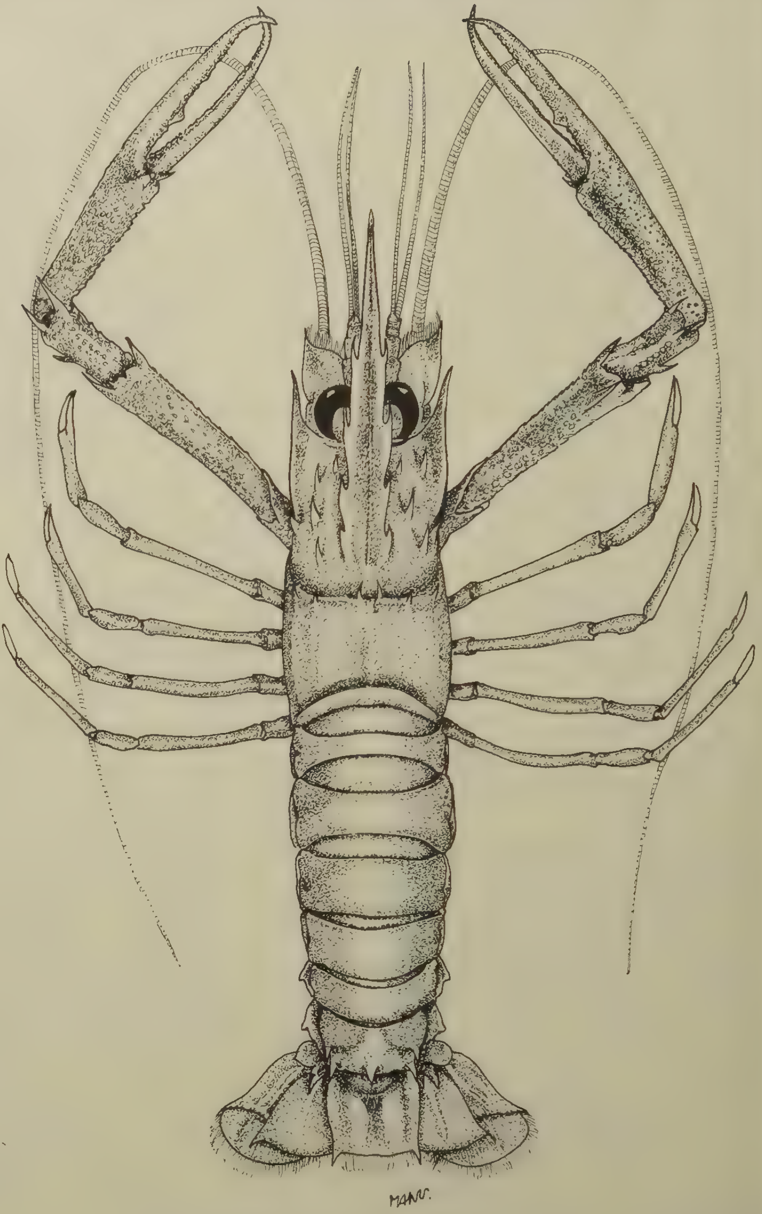
Habitat and Biology : Depth range from 140 to 640 m; substrate mud or sandy mud, firm enough for burrowing.

Size : Total body length to 25 cm, mostly between 13 and 18 cm.

Interest to Fisheries : Potential. Longhurst (1970:301) reported the species as having "been found in promising quantities in deep water". Wear (1980:25) considered the (still remote) possibility of culture of the species.

Local Names : NEW ZEALAND: New Zealand scampi, Deep-water scampi.

Literature : Yaldwyn, 1954:721-732, figs 1, 2.



(combined from Bate, 1888 and Yaldwyn, 1954) Fig. 140

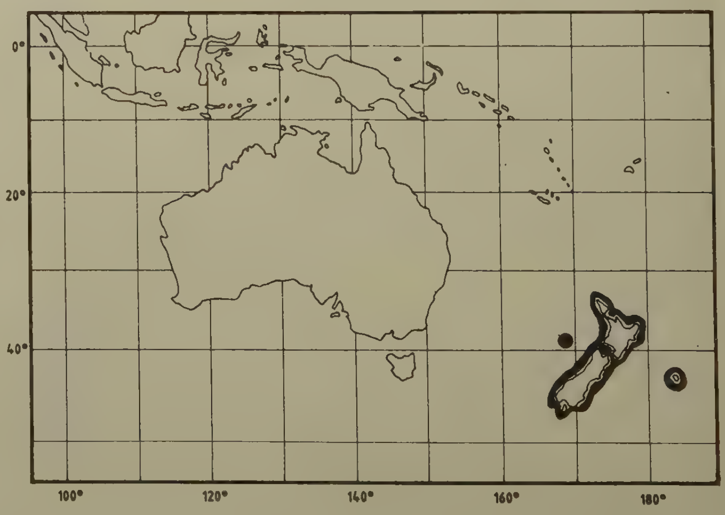


Fig. 141

Metanephrops formosanus Chan & Yu, 1987

Fig. 142

NEPH Metan 7

Metanephrops formosanus Chan & Yu, 1987, Crustaceana, 52:173, 184, text-fig.1, 2, pls 1, 2.

FAO Names : En - Formosa lobster.

Type : Type locality: "Ta-Chi, I-Lan Country", off north east coast of Taiwan, 180-400 m, bottom mud or sand. Holotype male and paratypes in NTOU; paratypes in RMNH.

Geographical Distribution : Indo-West Pacific region. Only known so far from the north-east and the south coasts of Taiwan (Fig. 143).

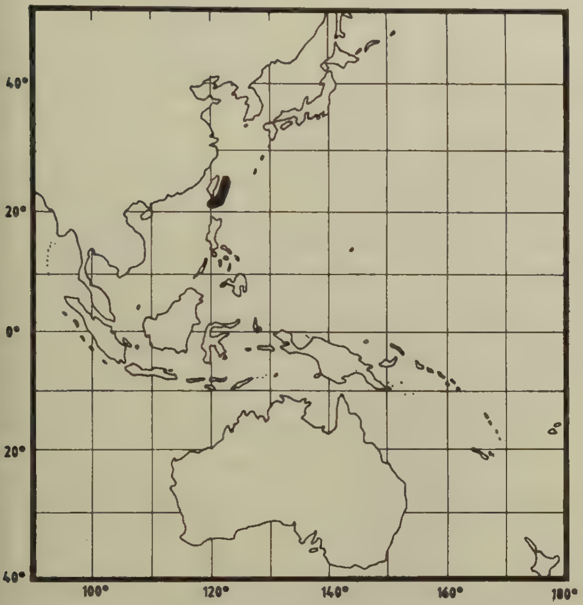
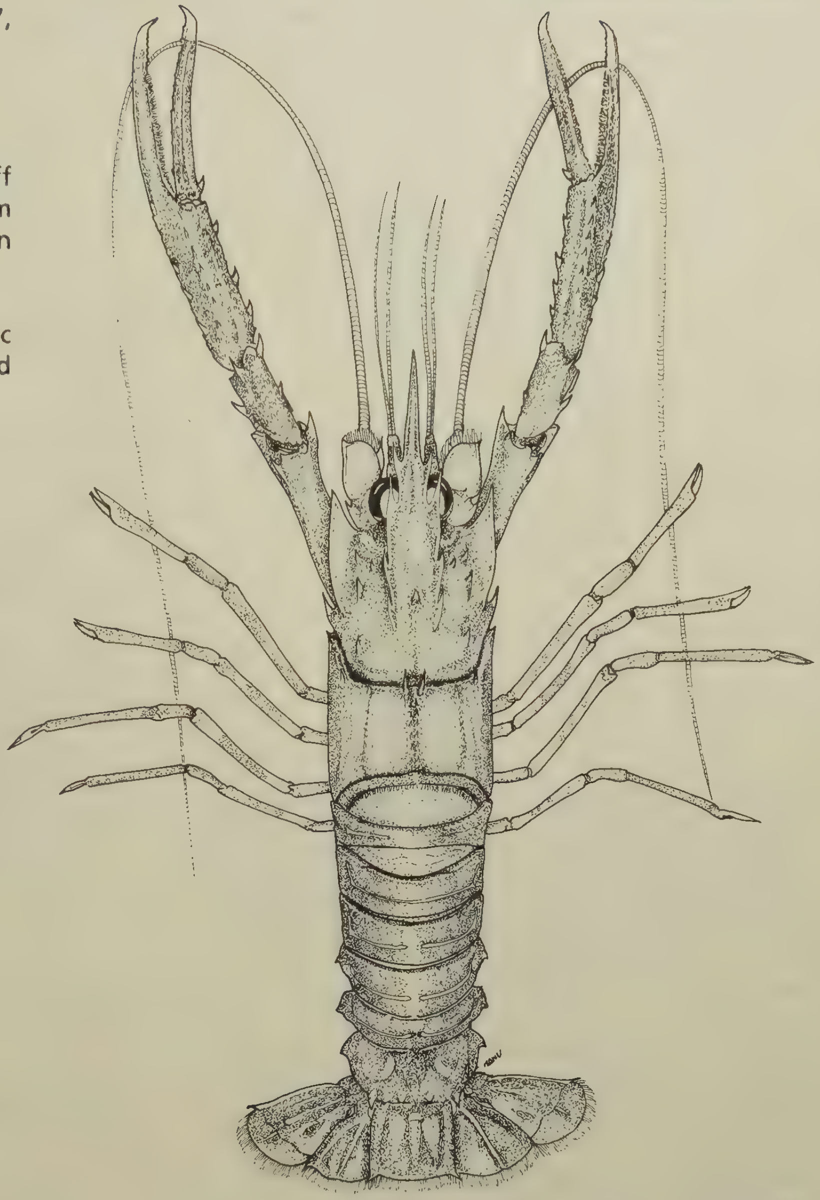


Fig. 143



(after Chan & Yu, 1987)

Fig. 142

Habitat and Biology : Depth range from 150 to 400 m, mostly around 250 m; bottom: mud or sand. Spawning time seems to be in late autumn.

Size : The known males have a total body length of 5 to 12 cm, the females, 5 to 9.5 cm; an ovigerous female measured 8.5 cm. Most specimens are 6 to 9 cm long. Carapace length: 1.8-4.1 cm (males), 1.7-4.8 cm (females), 3.1-4.0 cm (ovigerous females).

Interest to Fisheries : The species is "mainly caught by baby shrimp trawlers" (Chan & Yu, 1987:183) and sold fresh at the local markets where the price is rather high. The animals are caught throughout the year, but the catch is unstable and not large.

Local Names : CHINA (Taiwan): Te-Chia Shia (= armoured prawn); also used for other species of the genus.

Literature : Original description; Chan & Yu, 1991:27, pls 1c, 3c, 6d.

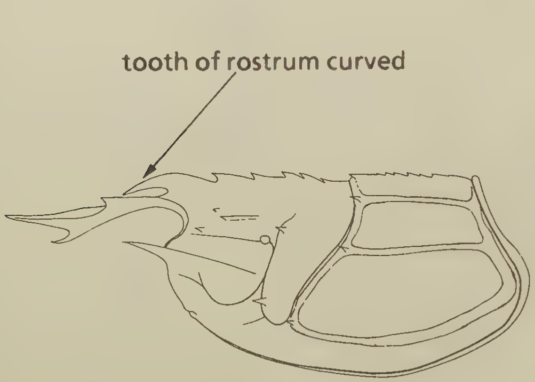
Metanephrops japonicus (Tapparone-Canefri, 1873)

Fig. 144

NEPH Metan 8

Nephrops japonicus Tapparone-Canefri, 1873, Memorie Reale Accademia delle Scienze Torino, (2)27:326, pl. 1.

FAO Names : En - Japanese lobster.



carapace (lateral view)
(from Holthuis, 1974)

Type : Type locality: "proveniente dal Giappone". Holotype in MZT, no.Cr.1062.

Geographical Distribution : Indo-West Pacific region: off the Pacific coast of Japan from Choshi, Chiba prefecture, Honshu to east coast of Kyushu (Fig. 145).

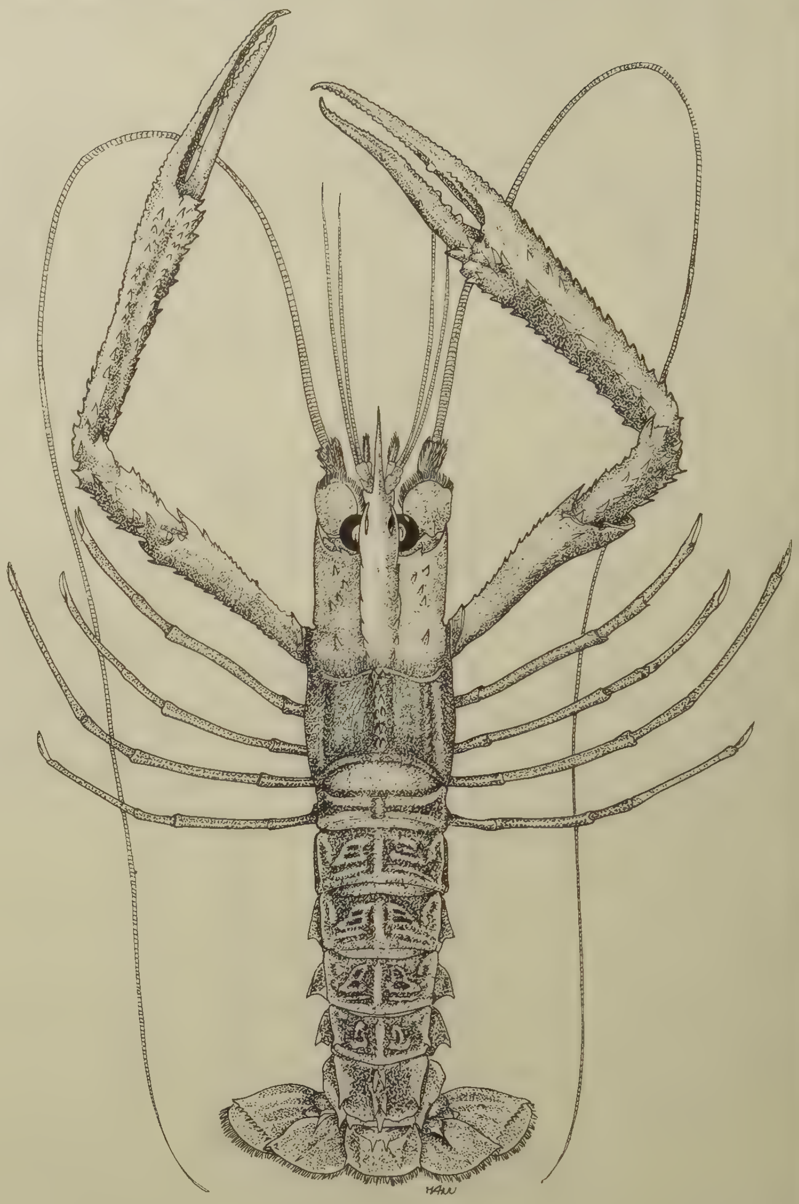
Habitat and Biology : Depth range from 200 to 440 m, usually between 200 and 300 m; bottom mud.

Size : Total body length 9 to 12 cm. Carapace length:3.7 cm (males), 3-6 cm (females).

Interest to Fisheries : The species is fished throughout its range mostly by trawlers. It is highly esteemed as gourmet food and sold fresh and frozen. In Tosa Bay, the fishing season is between September and April, the catch of this species being smaller there than that of ***M. sagamiensis***.

Local Names : JAPAN: Akaza, Akaza-ebi.

Literature : Baba et al., 1986:280; Chan & Yu, 1991:22, pls 1a, 3a, 5a, 7a.



dorsal view Fig. 144
(combined after Tapparone-Canefri, 1873 and Chan & Yu, 1991)

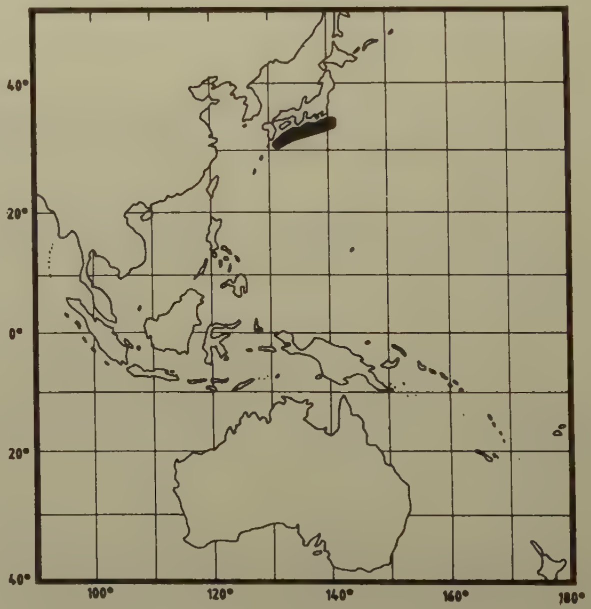


Fig. 145

Metanephrops mozambicus Macpherson, 1990

Fig. 146

Metanephrops mozambicus Macpherson, 1990, Mémoires Muséum National Histoire naturelle, Paris, (A)145:296, figs 2a,b, 3ab.

FAO Names : **En** - African lobster.

Type : Type locality: South east of Madagascar, "23°36.0'S-43°31.6'E, 395-410 m". Male holotype, MP no. AS 457; female allotype, MP no. AS 458.

Geographical Distribution : Indo-West Pacific region: off E. Africa (from Kenya to Natal), Madagascar (Fig. 147).

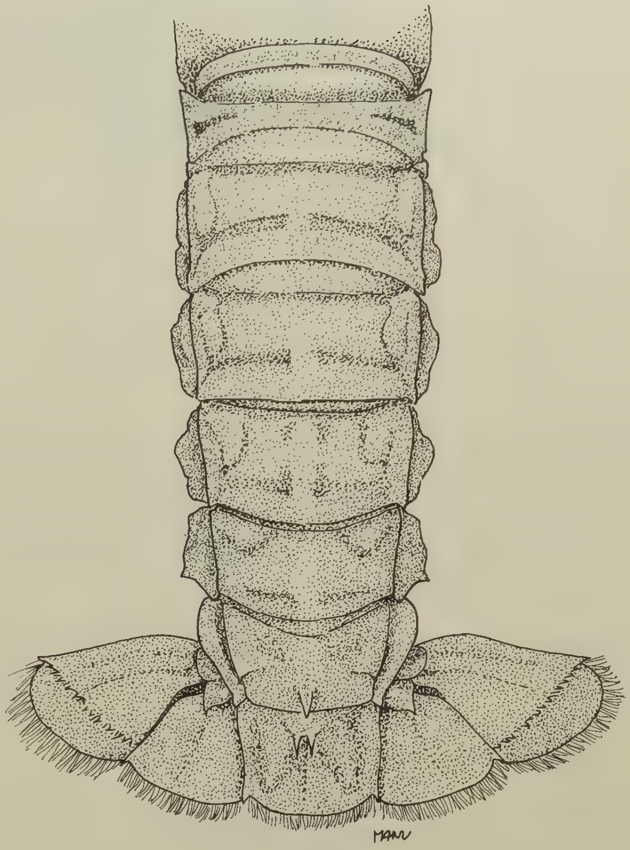
Habitat and Biology : Depth range from 200 to 750 m, most common between 400 and 500 m. Ovigerous females between December and June.

Size : Maximum total length: 20.5 cm (male), 20 cm (female). Carapace length 4.5 to 8.8 cm (males), 3.7 to 8.3 cm (females).

Interest to Fisheries : The species is trawled in commercial quantities off the South African east coast between Durban and Bazaruto with specially designed "balloon ballerina" nets to dig them out of the mud. According to FAO statistics, the catches of this species (under the previous name of ***M. andamanicus***) in South Africa in 1987 and 1988 amounted to 270 and 298 metric tons respectively. Crosnier & Jouannic (1973), reported catches of 5 kg/hr of this species made near Madagascar.

Literature : Macpherson, 1990:296, figs 2a,b, 3a,b; Chan & Yu, 1991:38, pls 2d, 4d, 6b, 8b.

Remarks: Before 1990 specimens of the present species were usually considered to belong to ***M. andamanicus.***



(combined after Macpherson, 1990 and Chan & Yu, 1991)

Fig. 146

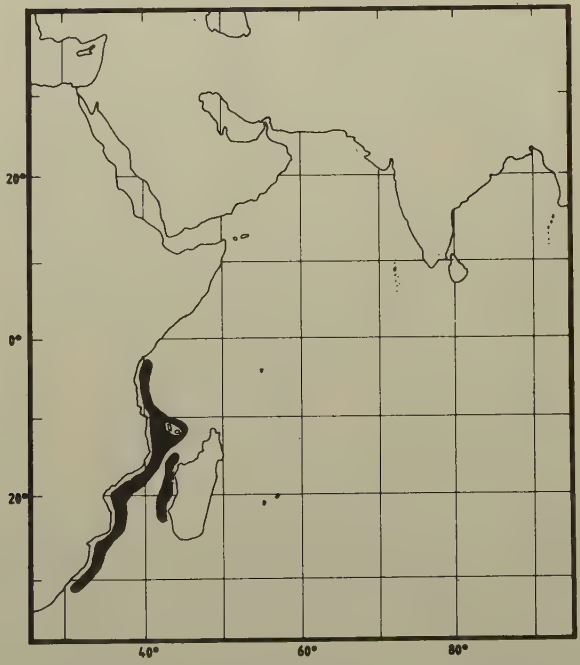


Fig. 147

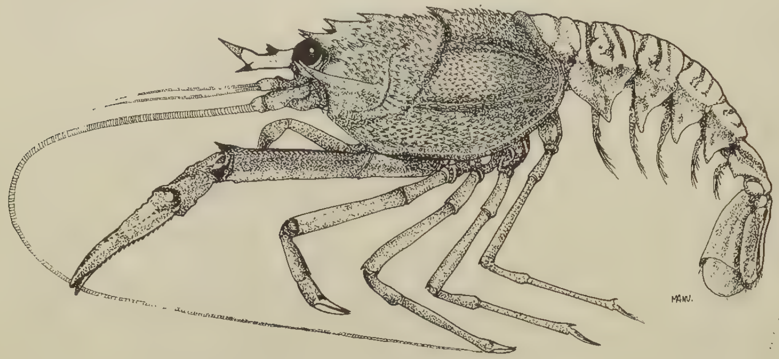
Metanephrops neptunus (Bruce, 1965)

Fig. 148

NEPH Metan 9

Nephrops neptunus Bruce 1965, Crustaceana, 9:274, pls 13-15.

FAO Names : En - Neptune lobster.



lateral view (after Bruce, 1965)

Type : Type locality: ""Cape St. Mary", Cr[uise]. 1/64, Station 26, Trawl 131 [South China Sea, south of Hong Kong]; 19°25.5'N 114°07.5'E to 19°22.0'N 114°11.0'E ... Agassiz Trawl, depth 400-435 fms [=732-796 m]". Holotype female in BM, no. 1964.9.28.1; allotype in RMNH (both types in alcohol, condition good).

Geographical Distribution : Indo-West Pacific region: South China Sea and off western Australia (Fig. 149).

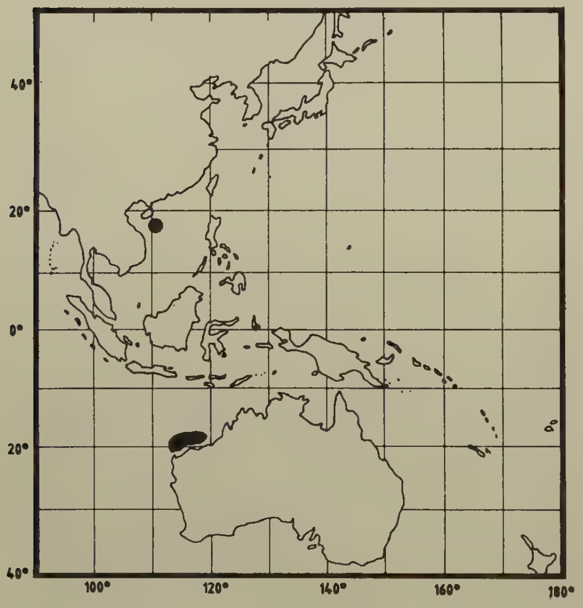
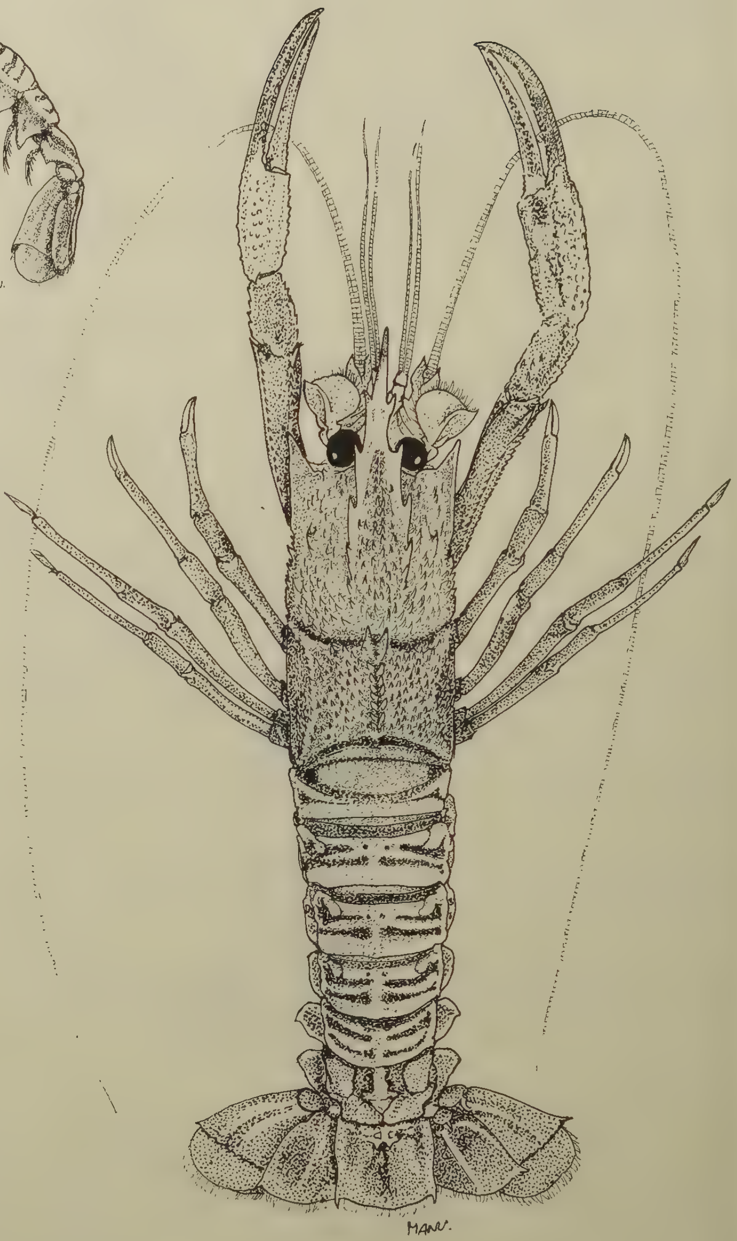


Fig. 149



dorsal view (after Bruce, 1965)

Fig. 148

Habitat and Biology : Depth range from 300 to 800 m. Bottom temperature 5°C-11.9°C. Substrate unknown.

Size : Total body length 18 to 25 cm.

Interest to Fisheries : Potential. George (1983:16) counts the present species among the five lobsters off Western Australia for which the "commercial prospects ... are probably the most encouraging".

Local Names : AUSTRALIA : Neptune's scampi.

Literature : Original description.

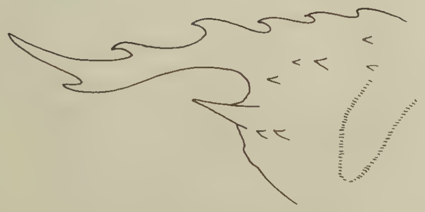
Metanephrops rubellus (Moreira, 1903)

Fig. 150

NEPH Metan 10

Nephrops rubellus Moreira, 1903, Lavoura, Boletim da Sociedade nacional de Agricultura Brazileira, 7:62.

FAO Names : En - Urugavian lobster.



front end of carapace (lateral view)
(from Moreira, 1905)

Type : Type locality: E.S.E. of Ilha Rasa at the entrance of the Bay of Rio de Janeiro "á distancia de 30 a 35 milhas da costa entre 43° e 43°30', W. Greenwich e á profundidade de 60 a 100 metros". Syntypes in MNRJ, and USNM, no. 29328.

Geographical Distribution : Western Atlantic region: off the east coast of South America between 23°S (off Rio de Janeiro, Brazil) and 38°S (off Buenos Aires Province, Argentina) (Fig. 151).

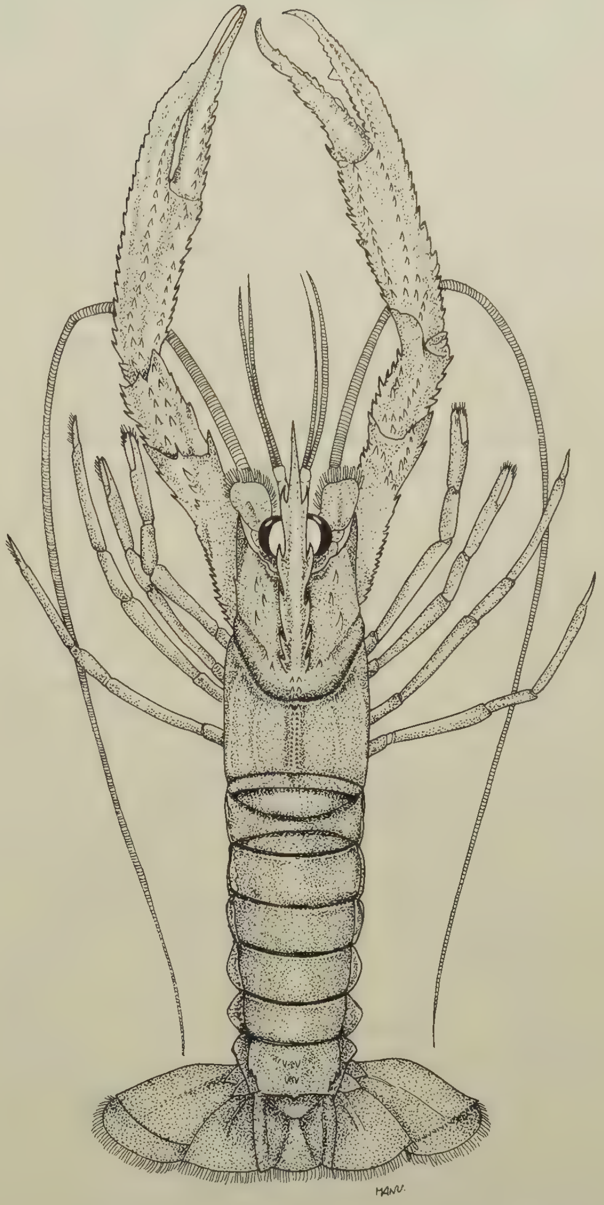
Habitat and Biology : Found in waters between 50 and 150 m deep.

Size : Total body length of adult specimens between 11 and 18 cm; carapace length between 5 and 8 cm.

Interest to Fisheries : So far none. The species is rather rare ("se encuentra raramente en nuestras costas" Barattini & Ureta, 1960:49) and certainly does not at present form the subject of a fishery.

Local Names : BRAZIL: Lagostim, Langostinha, Langostinha do Mar.

Literature : Moreira, 1905:128, pl.3; Ramos, 1950 :83-91, figs 1-3; Holthuis, 1974:836-839.



dorsal view (after Moreira 1905) Fig. 150

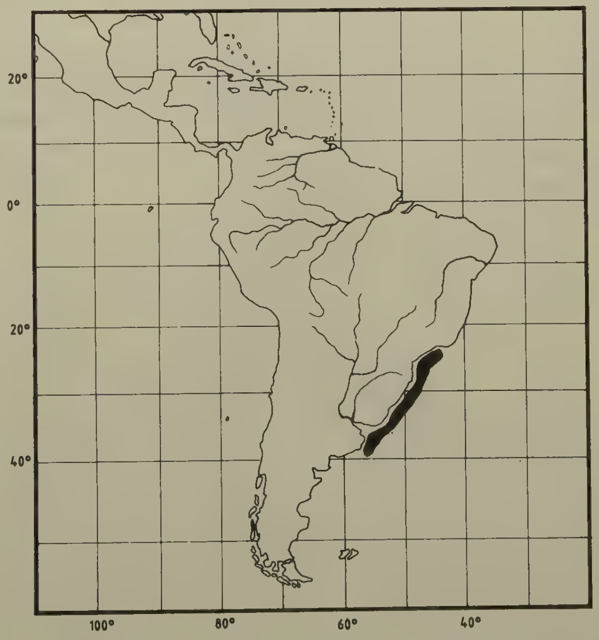


Fig. 151

Metanephrops sagamiensis (Parisi, 1917)

Fig. 152

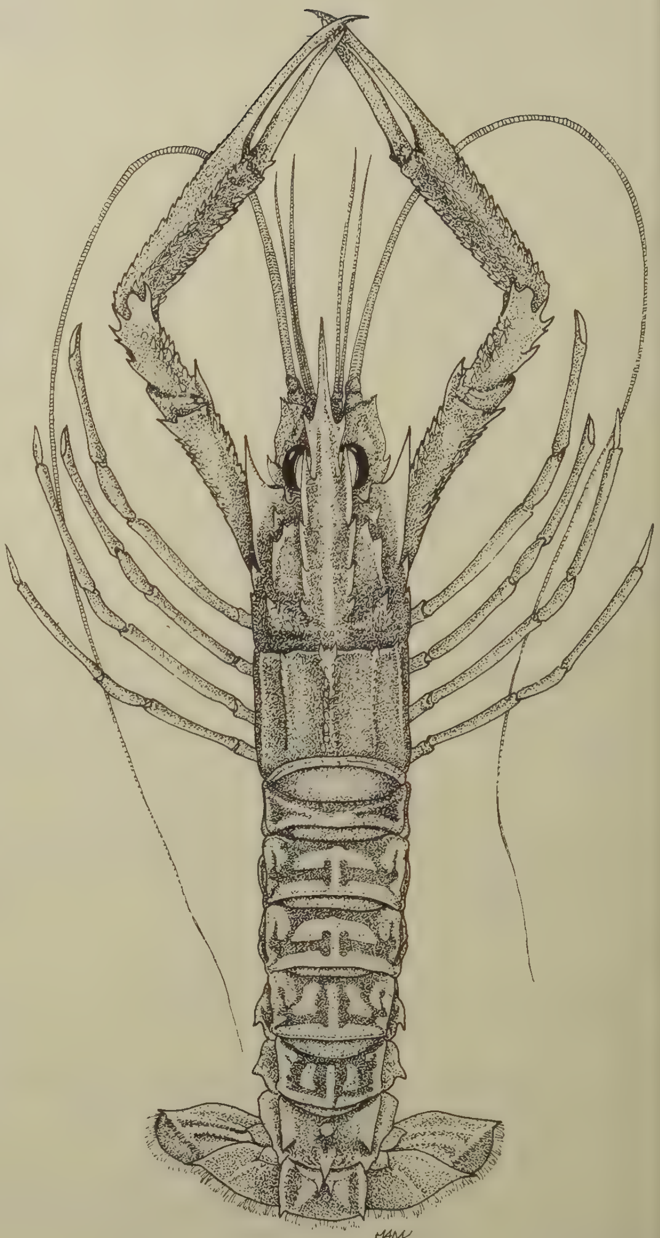
NEPH Metan 11

Nephrops sagamiensis Parisi, 1917, Atti Società Italiana Scienze naturali, 56:15.

Synonyms: ***Nephrops intermedius*** Balss, 1921.

FAO Names : En - Sculpted lobster.

Type : Type locality ***Nephrops sagamiensis***: "Baia di Sagami" (= Sagami Bay, Honshu, Japan); two paralectotypes in Museo Civico di Storia Naturale, Milano, Italy, no. 12-13 (ex 1494). Type localities of both ***Nephrops intermedius*** and ***N. sagamiensis***: "Misaki und Aburatsubo, Sagamibai, Sammlung Doflein, Nr. 2490"; and of ***N. sagamiensis*** (possibly also of ***N. intermedius***): "Station 9, Sagamibai [= 20°10'30"N 139°33'E], 250 m Tiefe, Sammlung Doflein". Through the lectotype selection for both species (see Remarks below), the type locality of both is now restricted to "Aburatsubo, Sagamibai, Japan" [= Aburatsubo near Misaki, Kanagawa Prefecture, Honshu, Japan]; lectotype is the specimen shown on pl. 1 fig. 2 of Balss's (1914) paper, it is preserved in ZSM under no. 33/5, the condition of the alcohol specimen is good; one lot of 3 paralectotypes (of both ***N. intermedius*** and ***N. sagamiensis***) from "Sagamibai, Misaki, Japan" is also preserved in ZSM, it has no. 33/1, and is preserved in alcohol in a good condition. The lectotypes and paralectotypes of ***N. intermedius*** all were collected by F. Doflein in 1904-1905, the lectotype bearing his collecting number 2490. Six lots (10 specimens) of ***Metanephrops japonicus*** from Sagami Bay in the collection of ZSM (nos. 33/1, 33/2, 33/3, 33/4, 33/6 and 36/1) are paralectotypes of ***N. sagamiensis*** (not quite certain for 33/1 and 33/3) but not of ***N. intermedius***.



(after Balss, 1914)

Fig. 152

Geographical Distribution : Indo-West Pacific region: from east coast of Japan near Sagami Bay to Taiwan (Fig. 153).

Habitat and Biology : Depth range from 300 to 400 m, mostly around 350 m.

Size : Carapace length 3 to 6 cm (males) and 4.5 to 6 cm (females), corresponding to a total body length of 6 to 14 cm (males) and 10 to 14 cm (females).

Interest to Fisheries : Very little information is available on this species. Baba et al. (1986:280) observed that "in Tosa Bay [Shikoku Island, Japan], the fishing season for ***M. sagamiensis*** as well as for ***M. japonicus***, is between September and April, the catch of ***M. sagamiensis*** being greater".

Local Names : JAPAN: Sagami akaza-ebi.

Literature : Baba et al., 1986:280; Chan & Yu, 1991:30, pls 1d, 3d, 5c, 7c.

Remarks : Balss (1914:84, pl. 1 fig. 2), under the name ***Nephrops japonicus***, dealt with several males and females as well as with a juvenile, no exact numbers being given. Later he (Balss, 1921:176) found that this material consisted of two distinct species, and that the specimen figured by him in 1914 was not the true ***N. japonicus*** and belonged to a species that he named ***Nephrops intermedius***; again he did not indicate the exact number of specimens of either species before him. Dr. Ludwig Tiefenbacher of the Munich Museum was so kind to inform me that in the collection of his museum there are two

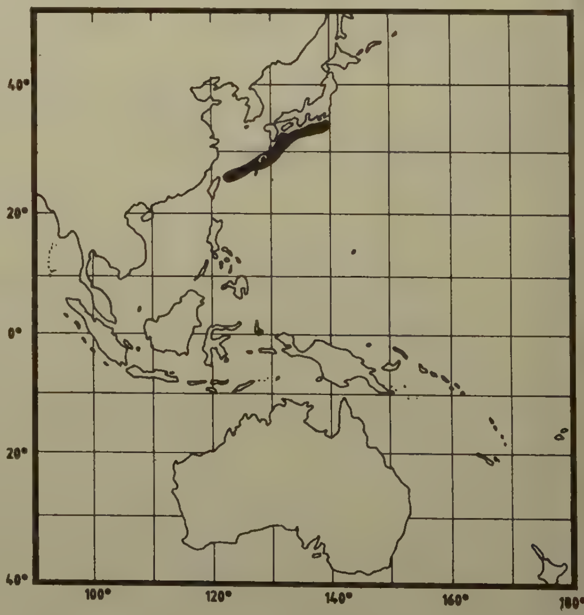


Fig. 153

lots (4 specimens) labelled ***N. intermedius*** and which form part of the Doflein collection; one of these specimens could be identified as the specimen figured by Balss (1914). All four specimens thus are syntypes of ***N. intermedius*** and the figured specimen is now selected as the lectotype of that species. In addition the Munich Museum holds five lots of ***Metanephrops japonicus***, all labelled ***Nephrops japonicus*** and all from Sagami Bay. Three of those lots (5 specimens) definitely form part of the material dealt with by Balss (1914), as one of them was collected in 1904 by Doflein and two others were collected in 1903 (one by K.A. Haberer, of the other the collector is not indicated but this could well be Haberer also). The two remaining lots only carry the indications "Sagamibai, Japan", but may well have belonged to Balss' (1914) material. Finally there is one lot of ***Metanephrops japonicus*** collected in Sagami Bay by Doflein, and thus certainly part of the 1914 material; however, this lot (1 specimen) bears in Balss' handwriting the incorrect label "***Nephrops sagamiensis*** Parisi"; it is not clear whether or not this is a syntype of ***Nephrops intermedius***, most likely it is not. If it were, however, then the type series of ***Nephrops intermedius*** would consist of two species and a lectotype selection is required.

Parisi (1917), when describing his new ***N. sagamiensis*** included in it all of Balss' (1914) ***Nephrops japonicus*** material; therefore all of Balss' specimens, both those of ***N. intermedius*** and those of ***N. japonicus*** are syntypes of ***N. sagamiensis*** as are also the two specimens before Parisi. The type material of ***N. sagamiensis*** thus is definitely heterogeneous and a lectotype should be chosen. The lectotype of ***N. intermedius*** is here chosen to be also the lectotype of ***N. sagamiensis***; this action now definitely establishes the identity of the two species, at the same time making their names objectively synonymous.

Metanephrops sibogae (De Man, 1916)

Fig. 154

NEPH Metan 12

Nephrops sibogae De Man, 1916, Siboga Expedition monograph, 39(a2):102, pl. 4 fig. 18.

FAO Names : En - Siboga lobster

Type : Type locality: Near the Kai Islands, Indonesia, "5°40'S., 132°26'E., 310 m. Bottom fine, grey mud". Syntypes (5 males, 4 females) in ZMA, no. De 104.197, condition fair.

Geographical Distribution : Indo-West Pacific region: Indonesia (type locality only) and Australia (Coral Sea north east of Cape York, and north west of Melville Island, Western Australia) (Fig. 155).

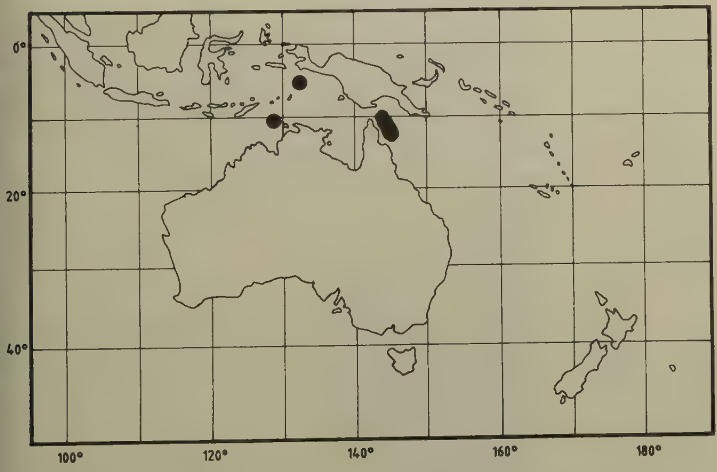
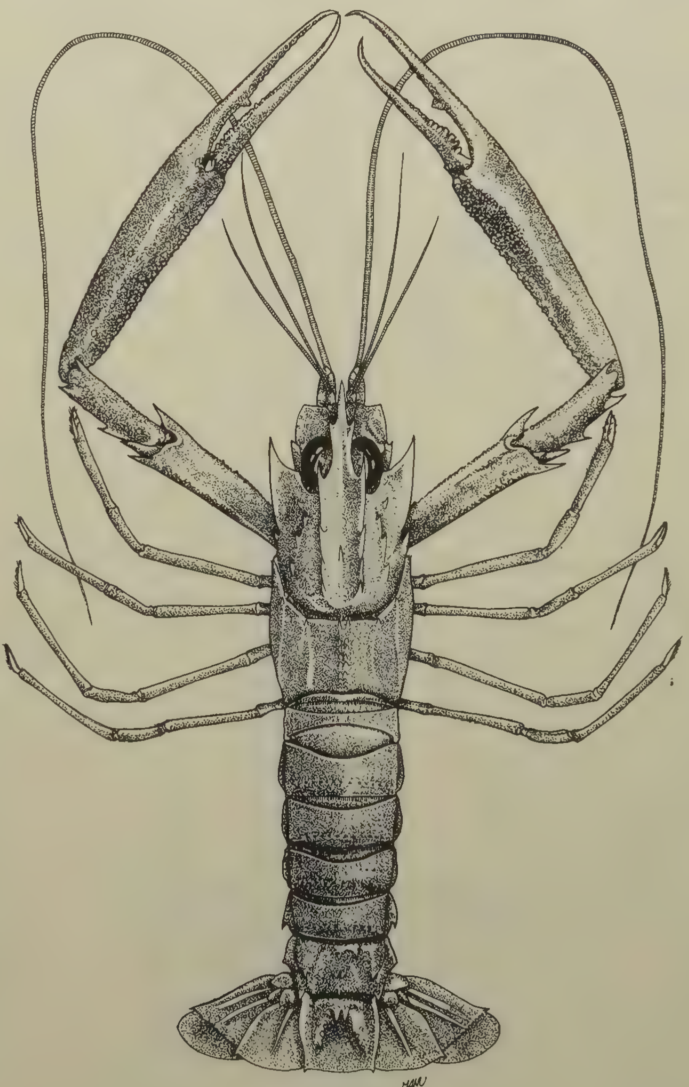


Fig. 155



(after De Man, 1916)

Fig. 154

Habitat and Biology : Depth range from about 300 to 310 m; bottom: soft sediments, like fine grey mud. Ovigerous females found in December.

Size : Total body length 11.5 to 18 cm; ovigerous females 13 and 13.5 cm.

Interest to Fisheries : Potential. The size of the specimens, the fact that they are not solitary (the type haul contained 9 specimens) and that they live on trawlable bottoms, makes them of potential interest for commercial fisheries. But too little is known about the habits and actual habitat of the species.

Local Names : AUSTRALIA: Siboga's scampi.

Literature : Original description.

Metanephrops sinensis (Bruce, 1966)

NEPH Metan 13

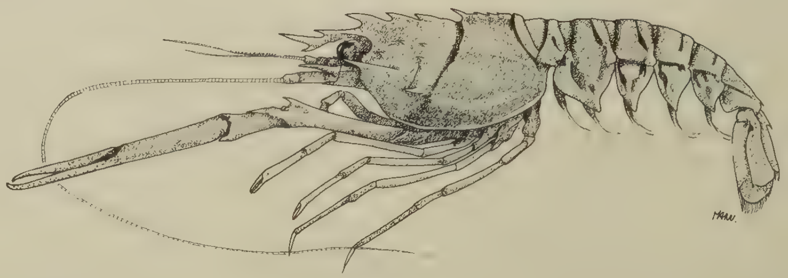
Nephrops sinensis Bruce, 1966, Crustaceana, 10:155, pls 10-12.

FAO Names : **En** - China lobster.

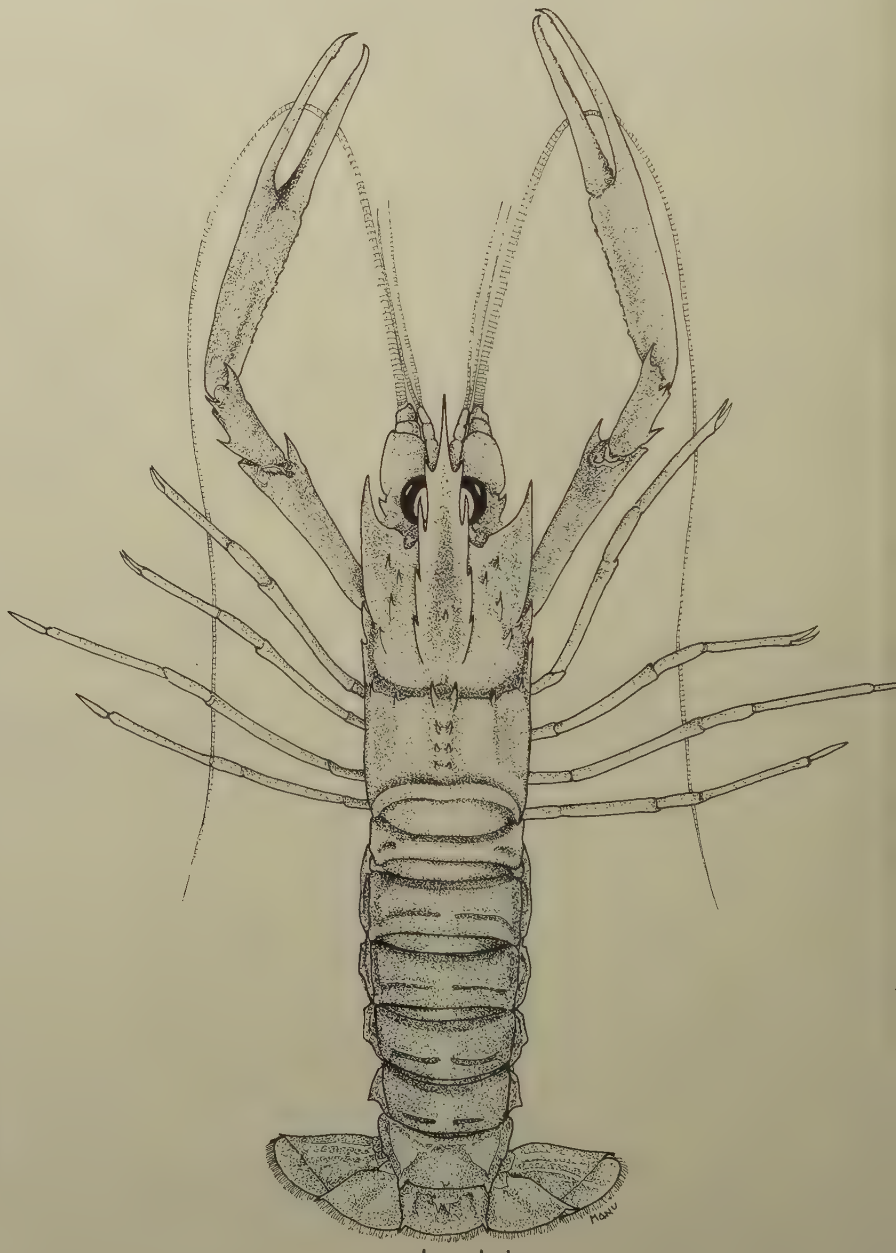
Type : Type locality: South China Sea, "Cape St. Mary" "Sta. 63, Trawl 54, 15°53.0'N 109°26.0'E to 15°53.7'N 109°25.3'E (approx.) .... depth 155 fms [= 283.5 m] (and deeper)". Holotype female in BM, no. 1964.9.28.2; allotype in BM, no. 1964.9.28.3 (both in alcohol, condition good); paratypes in RMNH, ZSI, and Fisheries Research Station Hong Kong.

Geographical Distribution : Indo-West Pacific region. Only known from the four localities in the South China Sea mentioned in the original description, all situated between 15°53'N-16°00'N and 109°25.3'E - 109°33'E (Fig. 157).

Fig. 156



lateral view



dorsal view

(after Bruce, 1966)

Fig. 156

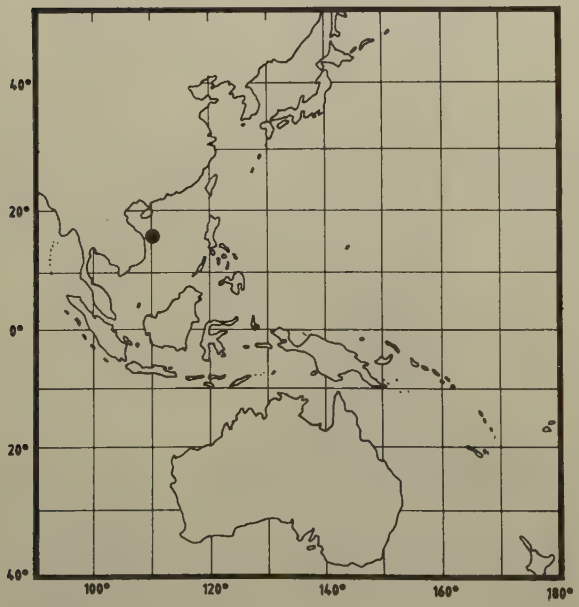


Fig. 157

Habitat and Biology : Depth range from (205-) 260 to 373 (-390) m. Bottom: mud, sometimes with shells. Ovigerous females were obtained in September.

Size : Total body length 6 to 15 cm.

Interest to Fisheries : One of the type lots was obtained with a commercial Granton trawl and consists of no less than 137 specimens (including 47 ovigerous females). Two other lots (also taken with a Granton trawl) contained 4 and 11 specimens, and the fourth (with Agassiz trawl) 5 specimens. The size of the specimens, their gregariousness and the configuration of the substrates where they are found, indicate that the species may be of commercial interest.

Literature : Original description.

Metanephrops thomsoni (Bate, 1888)

Fig.158

NEPH Metan 14

Nephrops thomsoni Bate, 1888, Report Voyage Challenger, Zool., 24:185, pl. 25 fig. 1, pl. 26 figs. 1-9.

FAO Names : **En** - Red-banded lobster.

Type : Type locality: "Challenger" "Station 204A, ... lat. 12°43'N., long. 122°9'E.; between Samboangan [= Zamboanga] and Manila; depth, 100 fathoms [= 182 m]; bottom, green mud". Male lectotype in BM, no. 88.22 (in alcohol, condition good).

Geographical Distribution : Indo-West Pacific region: Korea (Korea Strait), China (Yellow Sea, East China Sea, South China Sea), Japan (from Tosa Bay on the east coast of Shikoku Island, and the west coast of Kyushu south to the Ryukyu Islands), Taiwan, and the Philippines (off Tablas) (Fig. 159).

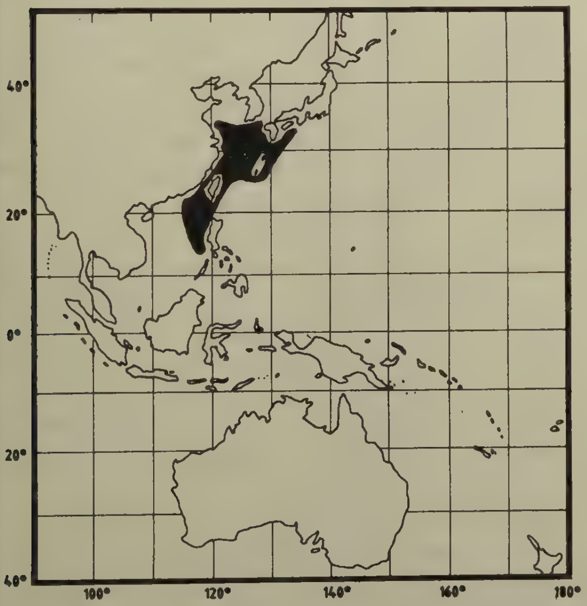


Fig.159

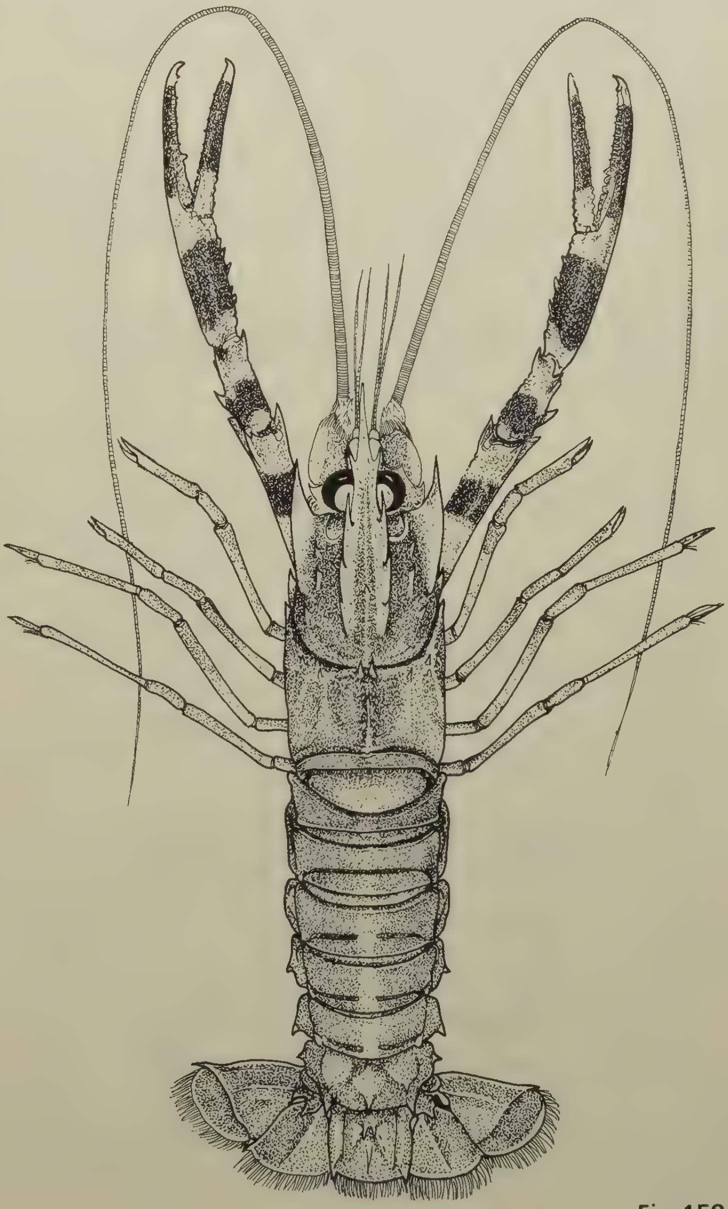


Fig.158

Habitat and Biology : Depth range from 50 to 500 m, on sandy mud bottom. Ovigerous females are generally caught in the East China Sea from the middle of September to the middle of April. The larval development has been described by Uchida & Dotsu (1973:23-35).

Size : Maximum total body length about 15 cm, usually not more than 12 cm.

Interest to Fisheries : In Korea the species is offered for sale at the Busan markets. According to Uchida & Dotsu (1973:23) the species "is usually caught in the East China Sea by trawl net fishing and used as food". In Taiwan the species is sold in markets, and its price is higher than that of ***M. formosanus***, which is found in greater quantities (Chan & Yu, 1987:183); it is sold there throughout the year, but is "not valuable" (Chang, 1965:48). Motoh, Dimaano & Pution (1978:22) mention that "a kind of red shrimp (probably ***Nephrops thomsoni***)" is caught by a bobo ("a kind of baited trap") "at deeper water exceeding to 40 m", in Mindanao, Philippines.

Local Names : JAPAN: Minami akaza-ebi ; CHINA (Province of Taiwan): Te-Chia Shia (also used for other species of the genus).

Literature : Baba et al., 1986:280.

Metanephrops velutinus Chan & Yu, 1991

Fig. 160

NEPH Metan 17

Metanephrops velutinus Chan & Yu, 1991, Crustaceana, 60(1):35, pls 2b, 4b, 6c, 8a,c,d.

FAO Names : **En** - Velvet lobster.

Type : Type locality: "Philippines, 13°51'N 120°30'E, 300-330 m". Male holotype, NTOU no. PM 1. Paratypes MP, RMNH, USNM, WAM.

Geographical Distribution : Indo-West Pacific region: Philippines (south-west of Luzon), Western Australia (Cape Leveque to Eucla) (Fig. 161).

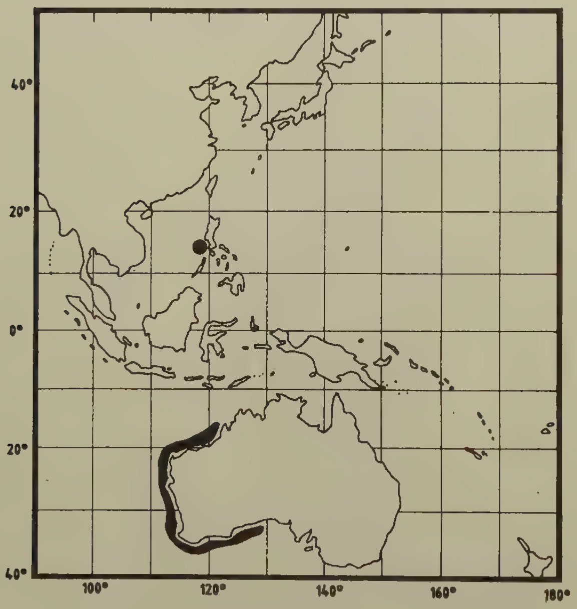
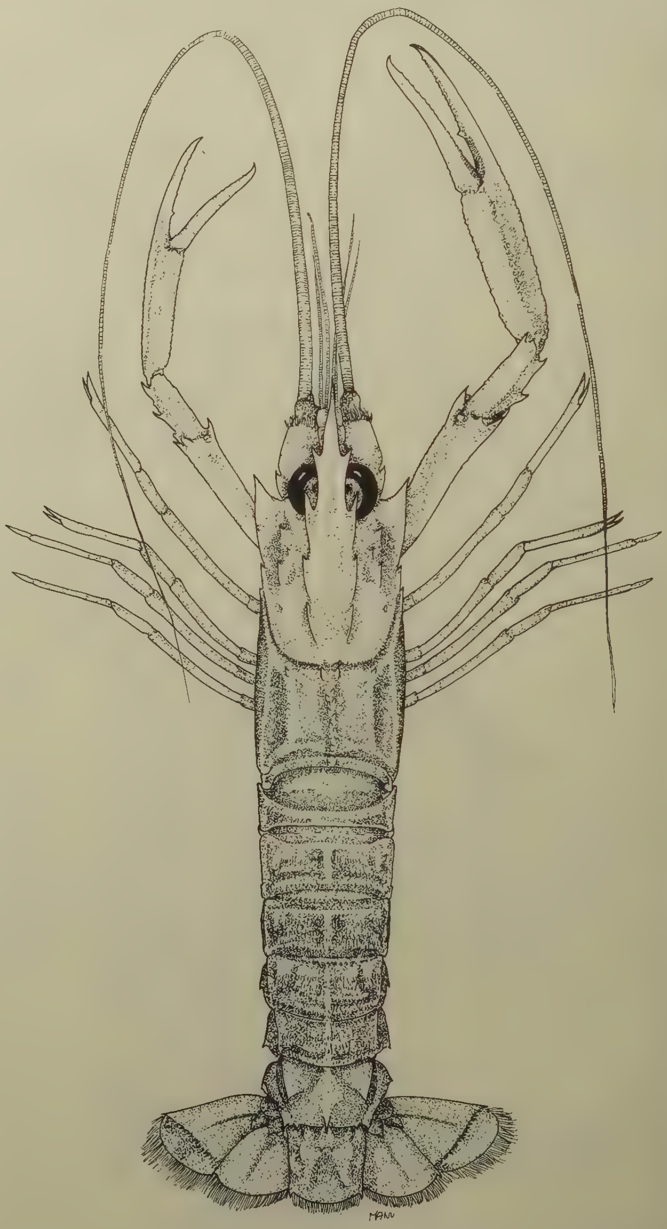


Fig. 161



(after Chan & Yu, 1991)

Fig. 160

Habitat and Biology : Depth range 238 to 702 m, most common at 350 to 450 m. Substrate hard mud.

Size : Carapace length: 3-8.6 cm (males), 2-7.4 cm (females), 4.7-8.2 cm (ovigerous females).

Interest to Fisheries : "***M. velutinus***, which appears slightly larger than ***M. armatus***, is fished commercially on the North West Shelf of Australia since 1985 (Wallner & Phillips, 1988, under the name of ***M. andamanicus***). Its price is higher than that of the spiny lobsters in Australia and many are used for export; however, the demand of the local markets has greatly increased recently (Bremner, 1985; Ward, Phillips pers.comm.). However, probably due to the low recovery rate of this lobster and the fact that the fishing gear is more selective for ovigerous females, the catch of the species has fallen significantly in the last few years (Wallner & Phillips, 1988)" (Chan & Yu, 1991:38).

Literature : Chan & Yu, 1991:35, pls 2b, 4b, 6c, 8a,c,d.

Remarks : Until 1991 specimens of this species were, often with some doubt, identified as ***M. andamanicus***.

Nephrops Leach, 1814

NEPH Neph

Nephrops Leach, 1814, Brewster's Edinburgh Encyclopaedia, 7:398, 400. Gender masculine. Name placed on the Official List of Generic Names in Zoology in Opinion 104 (published in 1928).

Type Species : by monotypy: ***Cancer norvegicus*** Linnaeus, 1758.

Although previously several Indo-West Pacific and tropical West Atlantic species have been assigned to this genus, at present it contains a single north east Atlantic species only. All other species are now placed in the genus ***Metanephrops***.

The single true ***Nephrops*** species, ***N. norvegicus***, is of considerable economic interest.

Nephrops norvegicus (Linnaeus, 1758)

Fig. 162

NEPH Neph 1

Cancer norvegicus Linnaeus, 1758, Systema Naturae, (ed.10)1:632. Name placed on the Official List of Specific Names in Zoology, in Direction 36 (published in 1956).

Synonyms : ***Astacus norvegicus*** - Fabricius, 1775; ***Homarus norvegicus*** - Weber, 1795; ***Astacus rugosus*** Rafinesque, 1814; ***Nephropsis cornubiensis*** Bate & Rowe, 1880; ***Nephrops norvegicus meridionalis*** Zariquiey Cenarro, 1935.

FAO Names : **En** - Norway lobster; **Fr** - Langoustine; **Sp** - Cigala.

Type : Type locality for ***Cancer norvegicus***: "in Mari Norvegico", restricted by lectotype selection by Holthuis (1974:824) to Kullen Peninsula in southern Sweden, 56°18'N 12°28'E. Lectotype and paralectotypes lost.

Type locality for ***Astacus rugosus***: Sicily. Type no longer extant.

Type locality for ***Nephropsis cornubiensis***: "off the Dudman" [= Dodman Point, Cornwall, UK, 50°13'N 4°48'W]. Type specimen supposed to be deposited "in the museum of the Athenaeum at Plymouth", but probably no longer extant.

Type locality of ***Nephrops norvegicus meridionalis***: Spain (both the Atlantic coast: Huelva, San Sebastian and Coruña, and the Mediterranean coast: Rosas, Barcelona, Alicante; and Spanish Morocco: Melilla). Type material in Zariquiey collection of the Instituto de Investigaciones Pesqueras, (at present: Instituto de Ciencias del Mar), Barcelona.

Geographical Distribution : Eastern Atlantic region: from Iceland, the Faeroes and northwestern Norway (Lofoten Islands), south to the Atlantic coast of Morocco; western and central basin of the Mediterranean; absent from the eastern Mediterranean east of 25°E; also absent from the Baltic Sea, the Bosphorus and the Black Sea. A record from Egypt is doubtful (Fig. 163).

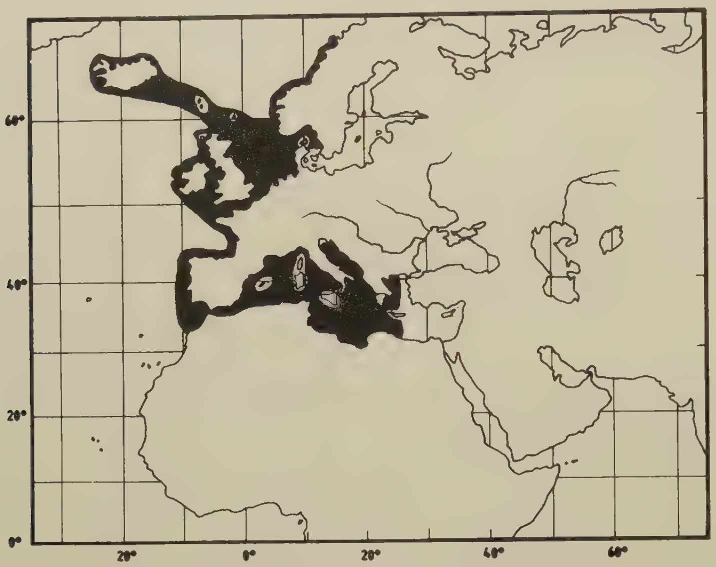


Fig. 163

Habitat and Biology : Depth range from 20 to 800 m; the species lives on muddy bottoms in which it digs its burrows. It is nocturnal and feeds on detritus, crustaceans and worms. Ovigerous females are found practically throughout the year, the eggs laid around July are carried for about 9 months.

Size : The total body length of adult animals varies between 8 and 24 cm, usually it is between 10 and 20 cm.

Interest to Fisheries : The species is of considerable commercial value and is fished for practically throughout its range. According to FAO statistics 59 767 tons were caught in 1987, 62 382 tons in 1988, mainly in the northeastern Atlantic (Fishing Area 27). The species is fished mostly in spring and summer. On the continental shelf, the fishery is most efficient in the very early morning, at twilight or in nights with full moon; on the continental slope, however, the fishery is most productive in daytime. It is caught mostly by trawling, more rarely with lobster pots. Sold fresh and frozen; also canned, either as plain peeled tails or prepared as "bisque de langoustines". Under the Italian name Scampi (plural of Scampo) it was sold all over Europe as a highly esteemed food; but soon the name Scampi became also used for large Penaeid shrimps.

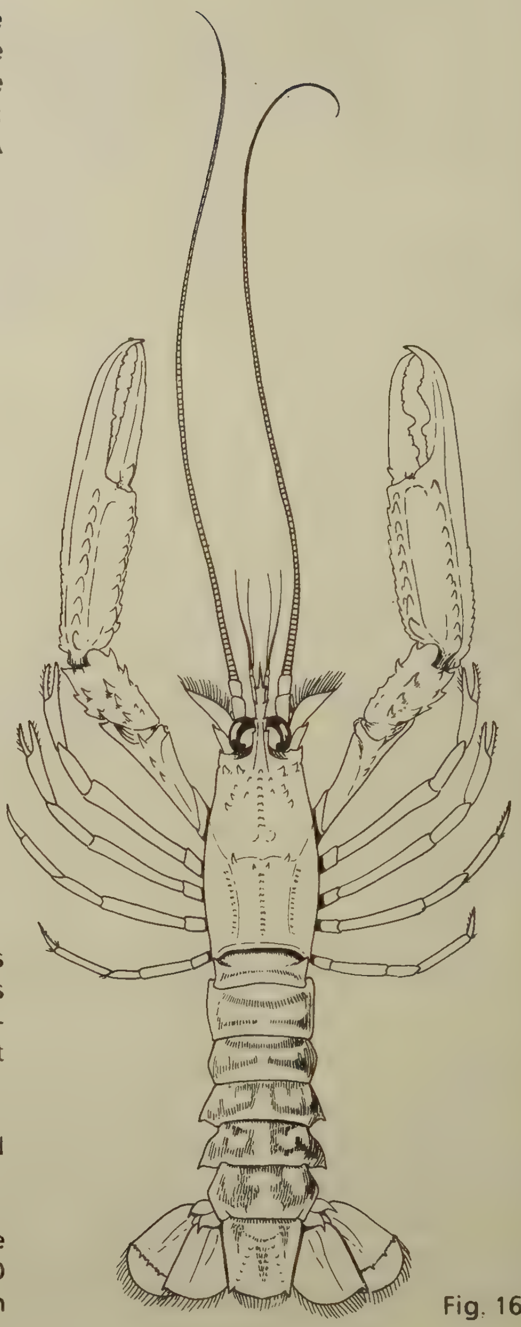


Fig. 162

Local Names : DENMARK: Bogstavhummer ; FRANCE: Langoustine, Cacahouète; GERMANY: Norwegischer Hummer, Buchstabenkrebs, Kaisergranat, Kaiserhummer; GREECE: Karavída; ICELAND: Letur humar; ITALY: Scampo, Scampolo; MONACO: Lengustina; MOROCCO: Azeffane, Langoustine; NETHERLANDS: Noorse kreeft; NORWAY: Bokstavhummer, Keiserhummer, Sjøkreps; PORTUGAL: Lagostim; SPAIN: Cigala, Escamarlanc, Maganto; SWEDEN: Kejsarhummer, Havskräfta; TUNISIA: Jarradh el bahr; UK: Norway lobster, Dublin bay prawn, Dublin prawn; YUGOSLAVIA: Skamp.

Literature : Palombi & Santarelli, 1961:365-365 (local Italian names); Farmer, 1975; Fischer, Bianchi & Scott (eds), 1981:vol.5; Fischer, Bauchot & Schneider (eds), 1987:302.

Thymopides Burukovsky & Averin, 1977

NEPH Thy

Thymopides Burukovsky & Averin, 1977, Crustaceana, 32:216. Replacement name for ***Bellator*** Burukovsky & Averin, 1976 (non ***Bellator*** Jordan & Evermann, 1896). Gender masculine.

Type Species: by original designation and monotypy for ***Bellator*** Burukovsky & Averin: ***Bellator grobovi*** Burukovsky & Averin, 1976.

Synonyms : ***Bellator*** Burukovsky & Averin, 1976, Zoologicheskii Zhurnal, Moscow, 55:296. Type species, see under ***Thymopides***. Gender masculine.

So far only one species of this genus is known; it may be potentially of economic value.

Thymopides grobovi (Burukovsky & Averin, 1976)

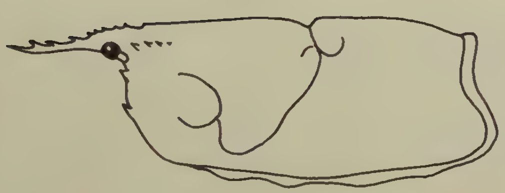
Fig.164

NEPH Thy 1

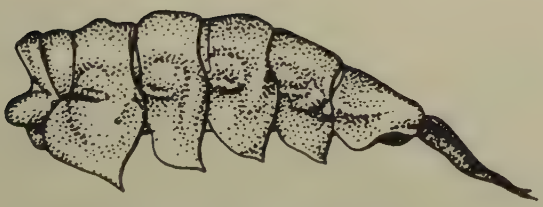
Bellator grobovi Burukovsky & Averin, 1976, Zoologischeskii Zhurnal, Moscow, 55:296, figs 1-4.

FAO Names : En - Bellator lobster.

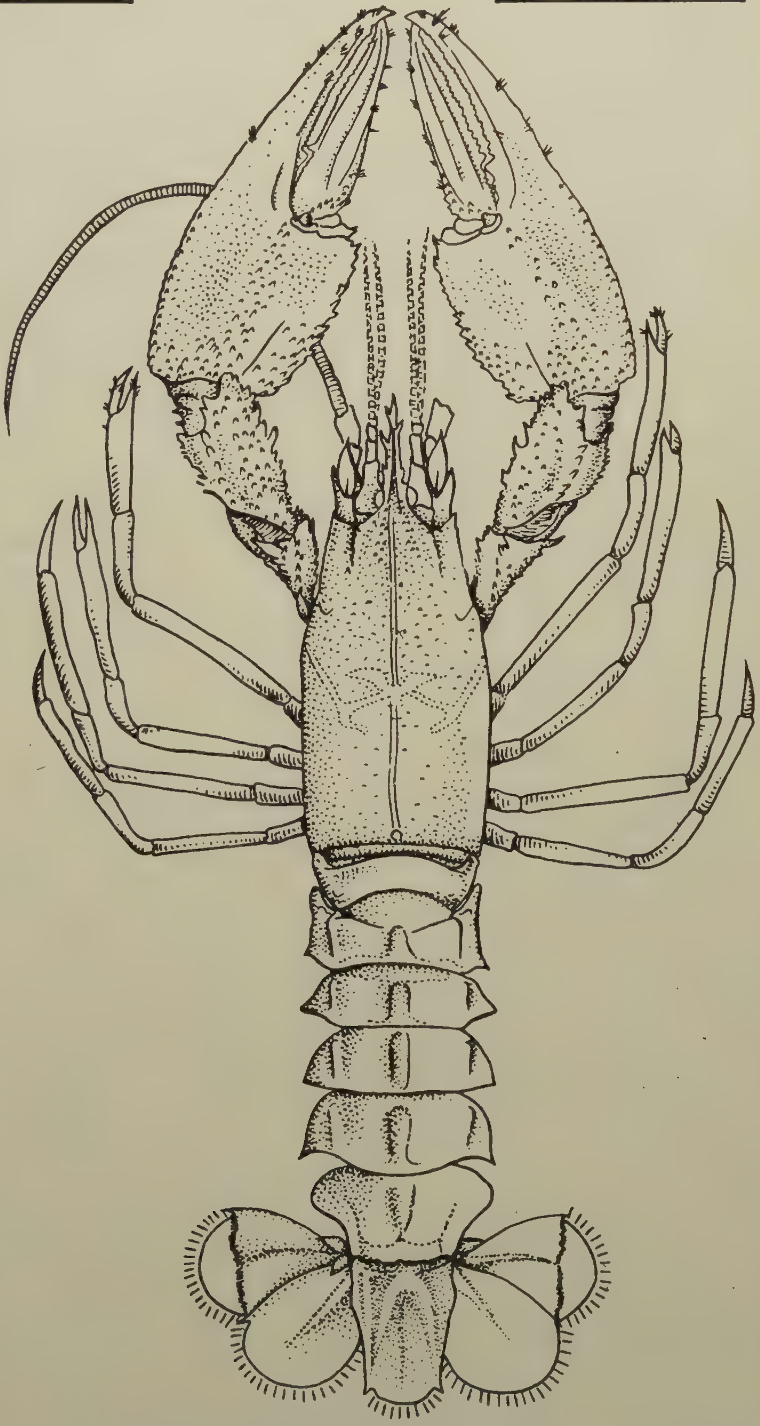
Type : Type locality: "in the Herd [= Heard] Island region [near Kerguelen] at a depth of 1,010 m", 51°30'S 69°37'E. Holotype male in ZISL.



carapace
(lateral view)
(after Ledoyer, 1979)



abdomen (lateral view)
(from Burukovsky & Averin, 1976)



dorsal view (from Burukovsky & Averin, 1976)

Fig. 164

Geographical Distribution : Southern Indian Ocean: area of Kerguelen Islands and Heard Island (47°-51.5°S 66°-75.5°E) (Fig. 165).

Habitat and Biology : Depth range from 560 to 1 220 m, on muddy substrate.

Size : Total body length between 3 and 11 cm, mostly between 6 and 11 cm.

Interest to Fisheries : The size of the animals and the fact that they occur in relatively great numbers (see Ledoyer, 1979) suggest that the species might be of potential commercial value. So far, however, this possibility has not been tested experimentally.

Literature : Ledoyer, 1979:123, figs 1, 2.

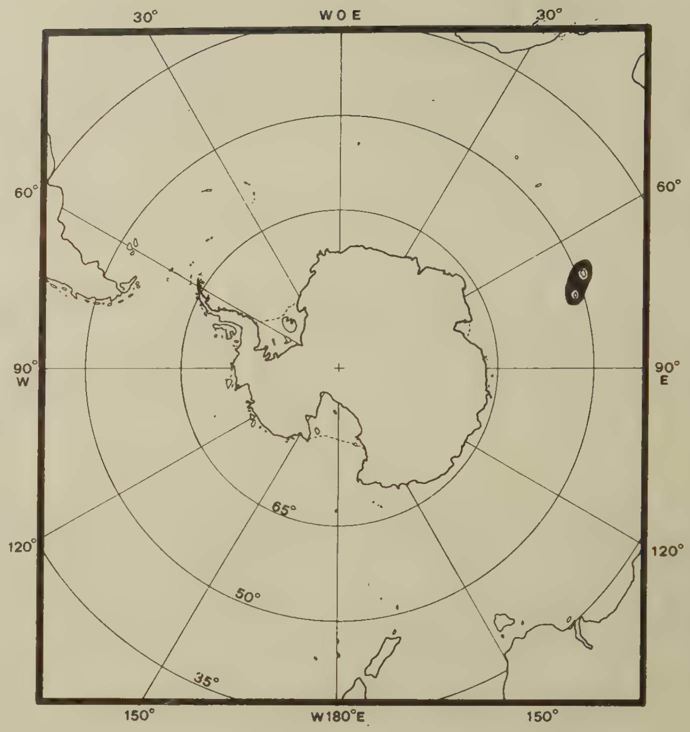


Fig. 165

2.2 INFRAORDER **PALINURIDEA** Latreille, 1802

Palinurini Latreille, 1802, Histoire naturelle générale et particulière des Crustacés et des Insectes, 3:31.

This infraorder consists of 3 superfamilies: Eryonoidea De Haan, 1841, Glypheoidea Zittel, 1885, and Palinuroidea Latreille, 1802. Only the last of these contains species that are of commercial interest.

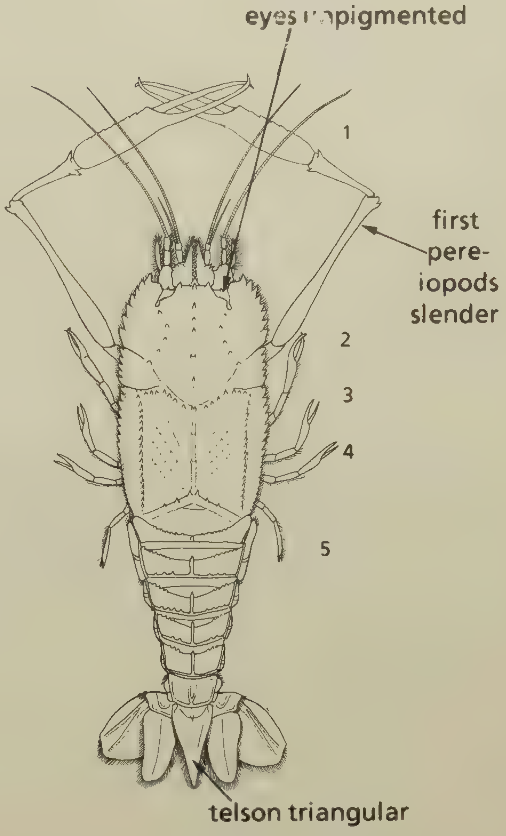
Key to the recent representatives of the three Superfamilies of Palinuridea

1a. Pereiopods 1 to 4 (or all) with true chelae, the first pair very slender, more than twice as long as the second pair. Eyes immovable, not protruding above surface of carapace, and without pigment. Telson triangular, pointed posteriorly (Fig. 166) .... **Eryonoidea**

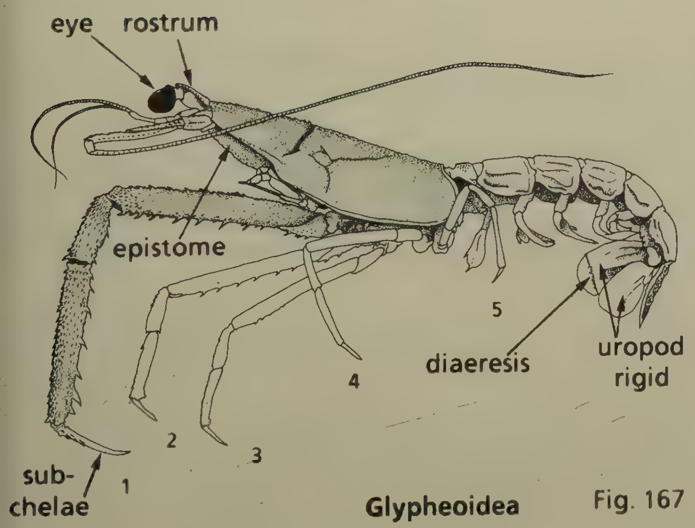
1b. Pereiopods 1 to 4 without true chelae, the first pair sometimes with a subchela. Eyes distinct, movable, cornea with pigment. Telson posteriorly broadly rounded (Figs 167, 168).

2a. Epistome large, 1.5 times as long as wide and about 1/3 of carapace length, its posterior margin about level with cervical groove of carapace. Endo- and exopod of the uropod firm throughout; exopod with a diaeresis. Rostrum well developed, reaching to the base of cornea. Eyes inserted on a median elevation of the cephalon, which reaches to about middle of the rostrum, with which it is partly fused. First pereiopods very strong, spiny and subchelate, the second somewhat similar, but smaller and with fewer spines (Fig. 167) .... **Glypheoidea**

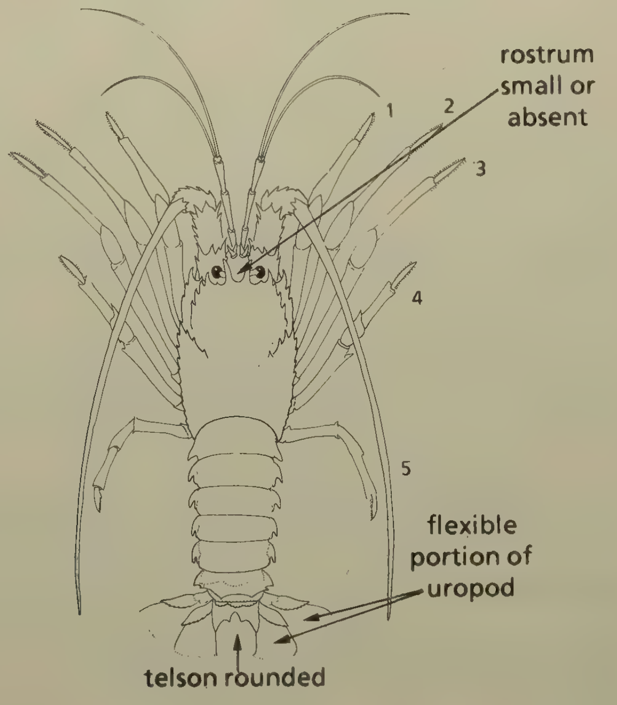
2a. Epistome small, wider than long, not reaching much behind level of eyes. Endo- and exopod of the uropods (as well as the telson) soft and flexible in their posterior half, being strongly chitinized only in the basal part. Rostrum usually very small or absent. Eyes not implanted on a median elevation of the cephalon (Fig. 168) ...... **Palinuroidea**


eyes unpigmented
1
first pereiopods slender
2
3
4
5
telson triangular

Eryonoidea Fig. 166


eye
rostrum
epistome
5
diaeresis
uropod rigid
4
2
3
sub-chelae
1

Glypheoidea Fig. 167


rostrum small or absent
1
2
3
4
5
flexible portion of uropod
telson rounded

Palinuroidea Fig. 168

SUPERFAMILY **ERYONOIDEA** De Haan, 1841

Eryonidea De Haan, 1841, in P.F. von Siebold, Fauna Japonica, (Crustacea) (5):148, 149.

This superfamily consists of four families, three of which contain only fossil species. The fourth, Polychelidae Wood-Mason, 1875, is the only one with recent representatives.

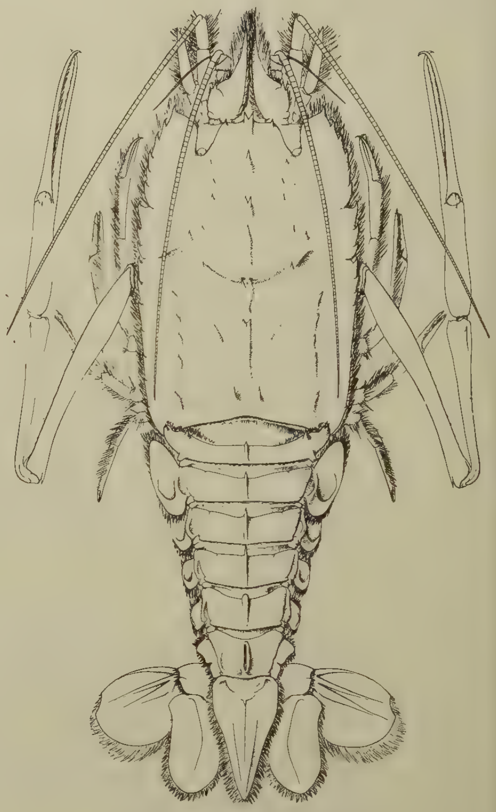
2.2.1 FAMILY POLYCHELIDAE Wood-Mason, 1875

POLY

Polychelidae Wood-Mason, 1875, Annals Magazine natural History, (4)15:132

This family has several genera and numerous species. All species inhabit the deep sea and none are of commercial value. Although some of them attain good sizes, they seem to have relatively little meat and for that reason are of no economic interest. However, some species can be caught in considerable quantities. During the 1964 cruises of R.V. JOHN ELLIOT PILLSBURY the catch of *Stereomastis sculpta talismani* (Bouvier, 1917) (Fig. 169), at one of the stations off West Africa, was so large that most of it had to be shoveled overboard.

Notwithstanding all this, none of the numerous (more than 35) species appears ever to have been brought to the fish markets, or sold as food or bait. Therefore this group is not further considered here. The taxonomy of the Polychelidae, especially of the generic level, is still very unsettled.



Stereomastis sculpta
(from S.I. Smith, 1882) Fig. 169

SUPERFAMILY **GLYPHEOIDEA** Zittel, 1885

Glyphaeidae Zittel, 1885, Handbuch der Paläontologie, 1(2):689.

This superfamily has three families, two of which are exclusively fossil. The third, Glypheidae Zittel, 1885, next to its numerous fossil taxa, contains a single recent genus with a single species.

Zittel (1885) cited Winkler (1881:73) as the author of the name Glyphaeidae. However, Winkler (1881) although dealing extensively with the genus ***Glyphea*** did not establish a family name based on this generic name, he at most used the expression "les glyphées". Zittel (1885) therefore must be considered the author of the family name; Zittel used the incorrect spelling ***Glyphaea*** and Glyphaeidae for the genus and family, respectively.

2.2.2 FAMILY GLYPHEIDAE Zittel, 1885

GLYPH

Glyphaeidae Zittel, 1885, Handbuch der Paläontologie, 1(2):689.

The only recent genus is the following:

Neoglyphea Forest & De Saint Laurent, 1975

GLYPH Neog

Neoglyphea Forest & De Saint Laurent, 1975, Comptes-Rendus hebdomadaires séances l'Académie Sciences, Paris, (D) 281:155. Gender feminine.

Type Species: by original designation (gen.nov., sp.nov.) and monotypy: ***Neoglyphea inopinata*** Forest & De Saint Laurent, 1975.

A single species.

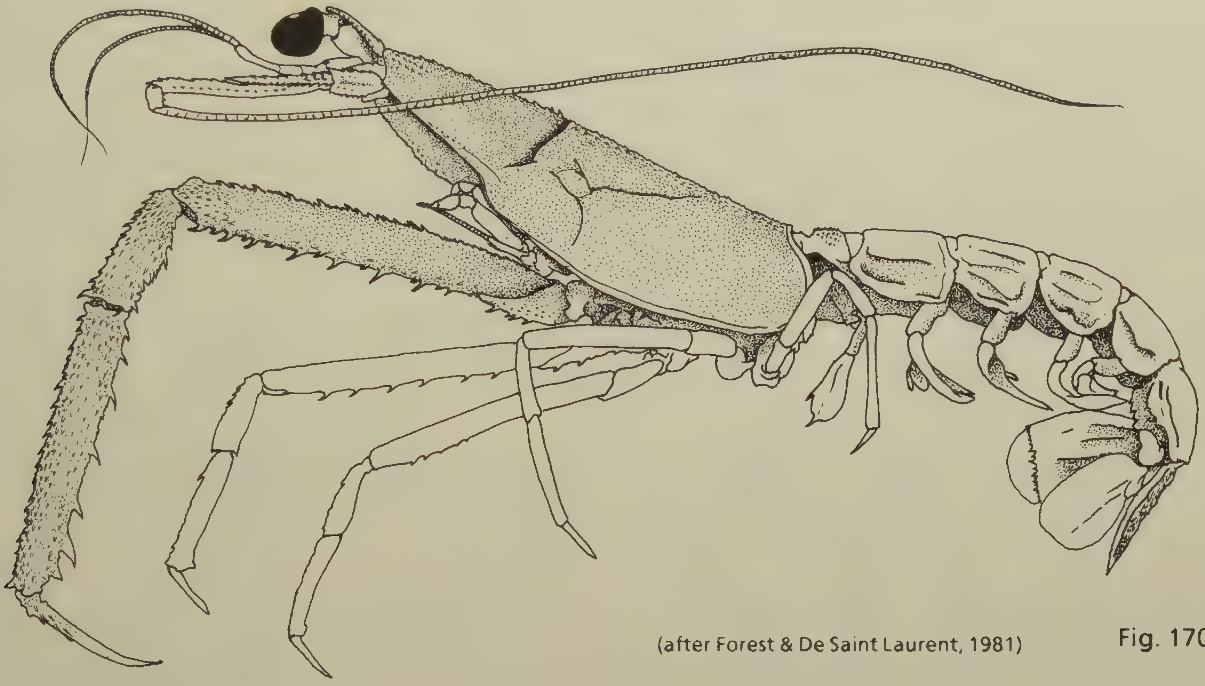
Neoglyphea inopinata Forest & De Saint Laurent, 1975

Fig. 170

GLYPH Neog 1

Neoglyphea inopinata Forest & De Saint Laurent, 1975, Comptes-Rendus hebdomadaires séances l'Académie Sciences, Paris, (D)281:155, pls 1, 2.

FAO Names : En - Fenix lobster.



(after Forest & De Saint Laurent, 1981)

Fig. 170

Type : Type locality: "Albatross, Station 5278 .... 14°00'10"Nord; 120°17'15"Est; 185 m", south west of entrance of Manila Bay, Philippines. Holotype male, in USNM, no. 152650.

Geographical Distribution : Indo-West Pacific region. The species is known only from 14 specimens all trawled south west of the entrance of Manila Bay in a small area between 13°59.0'- 14°08.0'N and 120°15.8'-120°20.5'E, 186-189 m, and from 3 specimens taken in the Timor Sea, 9°46'S 130°00'E, 240-300 m (Fig. 171).

Habitat and Biology : Depth range from 186 to 300 m; firm substrate with mud.

Size : Total body length between 7 and 14.9 cm, carapace length between 3 and 6.7 cm.

Interest to Fisheries : The scarcity of the species (only 17 specimens known) and its probably very restricted range, do not make it a likely subject for a fishery.

Literature : Forest & De Saint Laurent, 1981:51-84, figs 1-28.

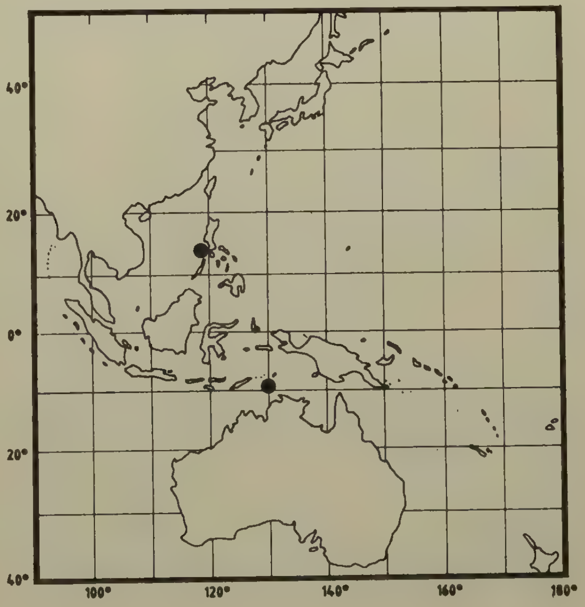


Fig. 171

SUPERFAMILY **PALINUROIDEA** Latreille, 1802

Palinurini Latreille, 1802, Histoire naturelle générale et particulière des Crustacés et des Insectes, 3:31.

Three families make up this superfamily, namely the Palinuridae (spiny lobsters), Synaxidae (furry lobsters) and Scyllaridae (slipper lobsters), they will be dealt with in this order.

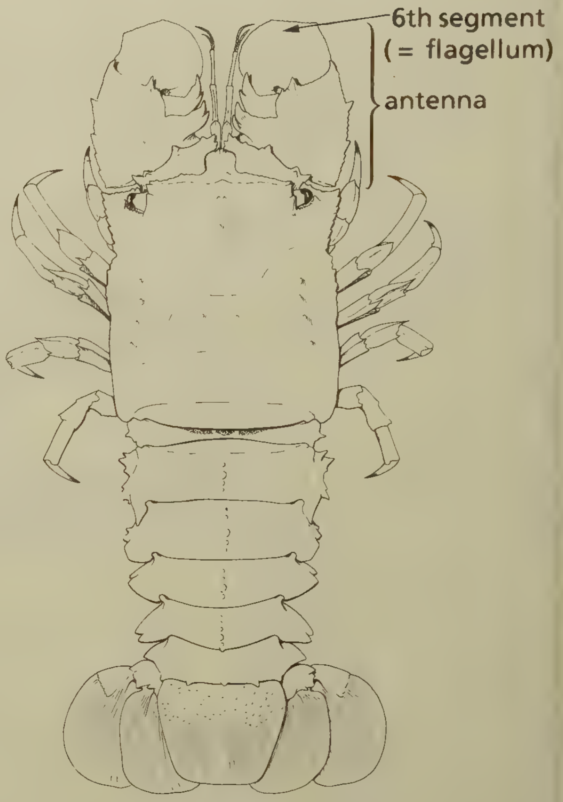
Key to Families

1a. Antennal flagellum reduced to a single, flat, plate which forms the sixth and final segment of the antenna. The shovel-like appearance of the antennae is responsible for the names shovel-nose lobster and bulldozer lobster also used for the animals of this group (Fig. 172) .... **Scyllaridae**

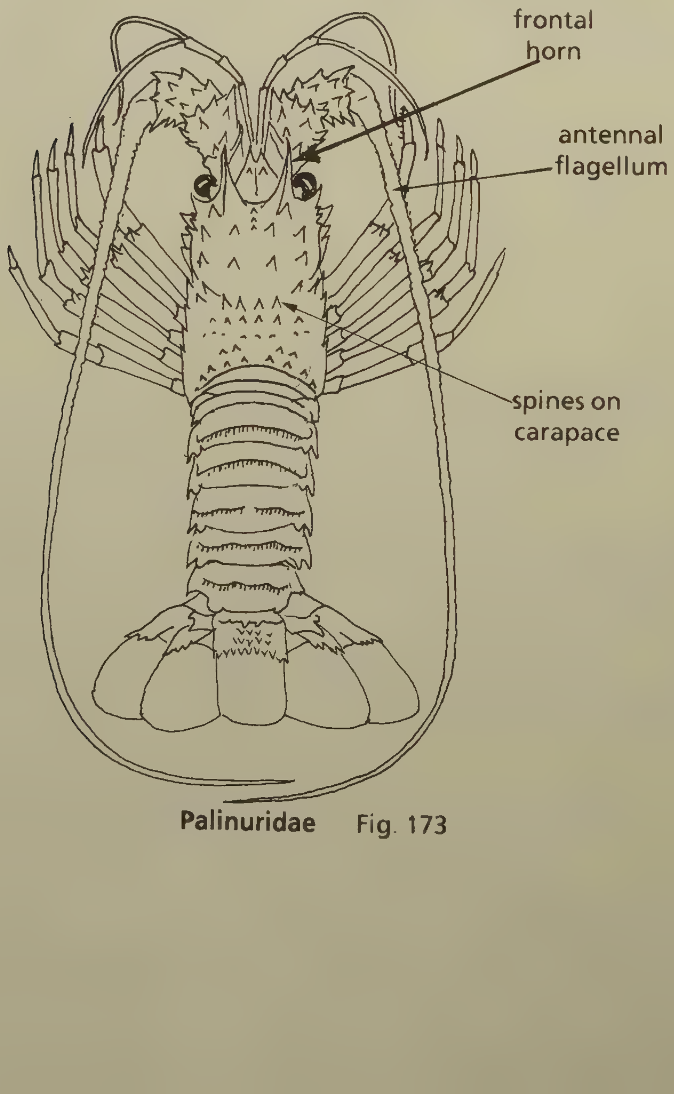
1b. Antennal flagellum long and consisting of numerous small articles, whip-like or spear-like

  2a. Rostrum absent or visible as a small spine on anterior margin of carapace. Carapace with a pair of frontal horns above the eyes, and usually with spines on the dorsal surface; hairs on carapace, if present, few and scattered (Fig. 173) .... **Palinuridae**

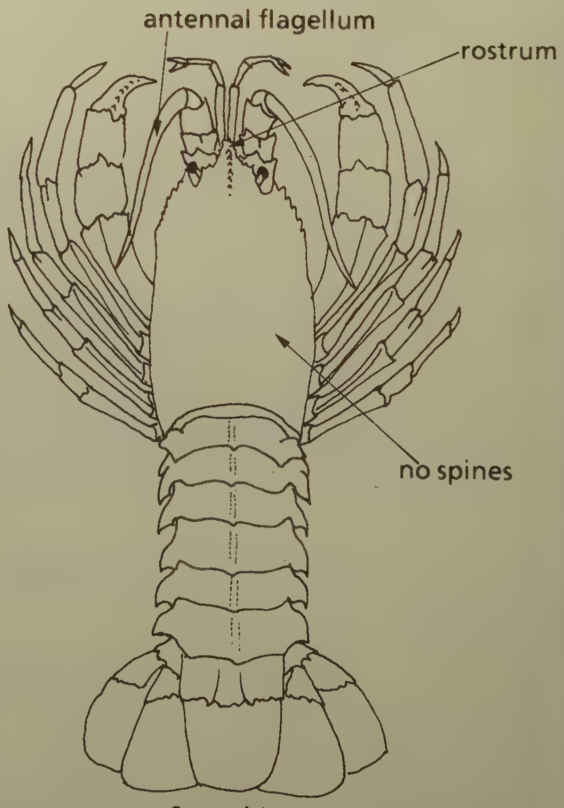
  2b. Rostrum a large, broad and flat triangular or rounded plate between the eyes. Carapace without frontal horns or other spines. Body covered only with granules and a rather dense fur of short hair (Fig. 174) .... **Synaxidae**



Scyllaridae Fig. 172



Palinuridae Fig. 173



Synaxidae Fig. 174

FAMILY PALINURIDAE Latreille, 1802

Palinurini Latreille, 1802, Histoire naturelle générale et particulière, des Crustacés et des Insectes, 3:31. Name placed on the Official List of Family Names in Zoology, in Opinion 519 (published in 1958).

This family, known best as spiny lobsters or langoustes, consists of eight genera (***Jasus, Justitia, Linuparus, Palinurus, Palinustus, Panulirus, Projasus*** and ***Puerulus***). Several of these genera are of great economical value, others are of minor or only potential importance. All known species of the family are dealt with in this catalogue.

Key to Genera:

1a. First pair of legs enlarged in males, ending in subchelae, with wide, red crossbands; carapace ornamented with a strong, scale-like sculpture; abdomen brick red, with 4 or 5 conspicuous transverse grooves on each somite and with yellowish spots and stripes (Fig. 175) .... ***Justitia***

1b. First pair of legs not enlarged, with no trace of a pincer, without crossbands; carapace without a scale-like sculpture; abdomen variously coloured, smooth or with at most 2 transverse grooves per somite

2a. Frontal horns fused to a broad 2- or 4-spined median projection on the anterior margin of the carapace between the eyes; antennal flagella straight, inflexible (Fig. 176) .. ***Linuparus***

2b. Two distinct, widely separated tooth-like frontal horns, between which the anterior margin of the carapace is visible; antennal flagella although large and firm, quite flexible

3a. Flagella of antennulae long, whip-like, longer than peduncle of antennules (Fig. 177) .... ***Panulirus***

3b. Flagella of antennules short, shorter than last segment of antennular peduncle

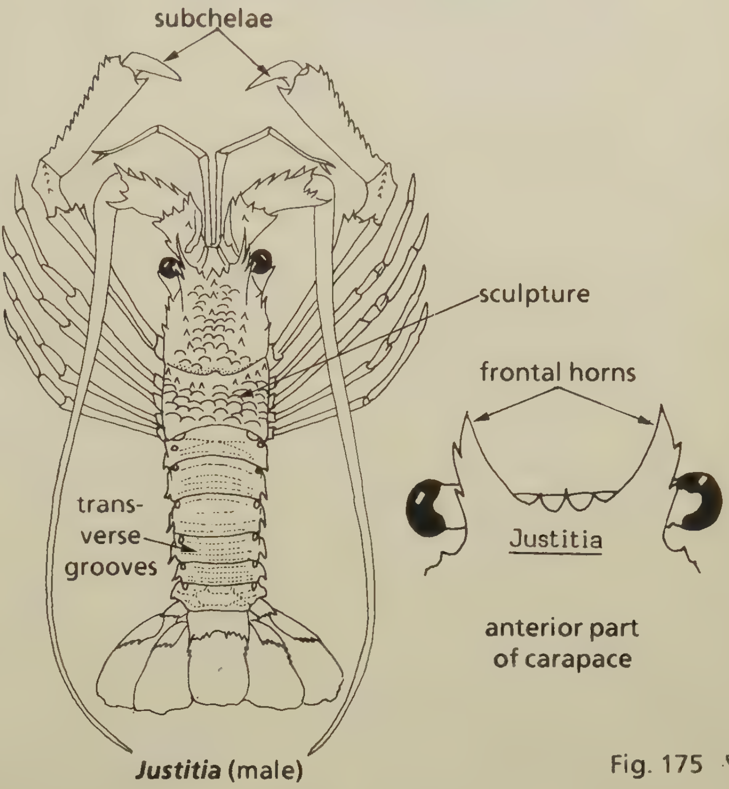

subchelae
sculpture
frontal horns
trans-
verse
grooves
Justitia
anterior part
of carapace
Justitia (male)

Fig. 175

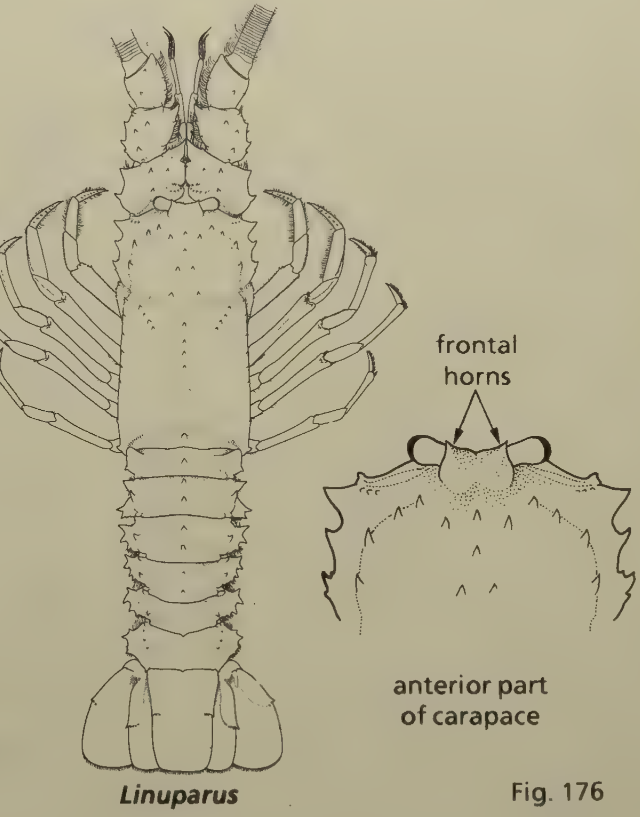

frontal
horns
anterior part
of carapace
Linuparus

Fig. 176

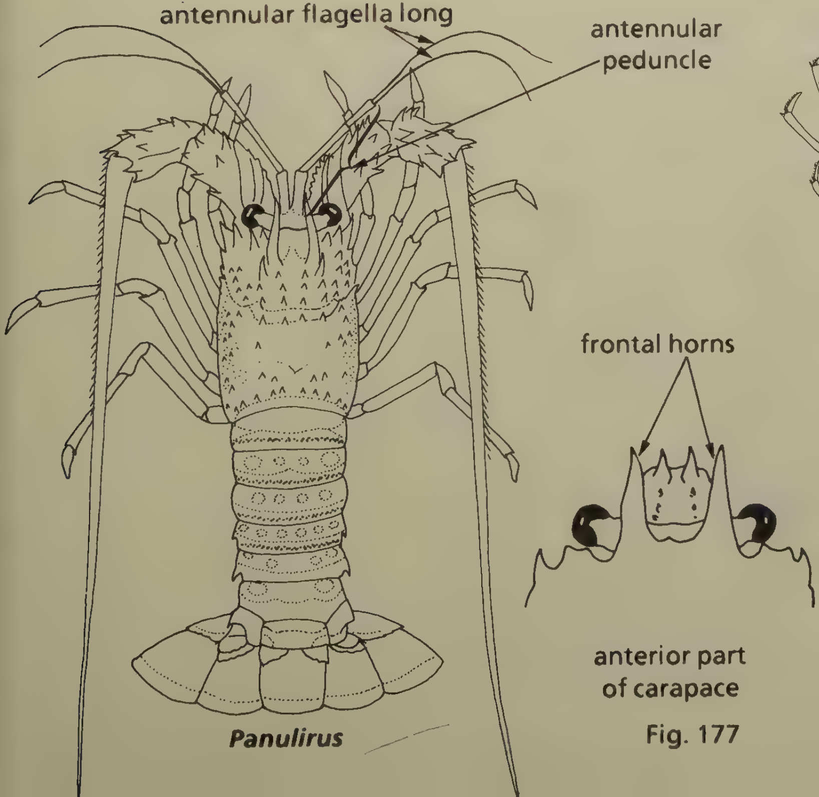

antennular flagella long
antennular
peduncle
frontal horns
anterior part
of carapace
Panulirus

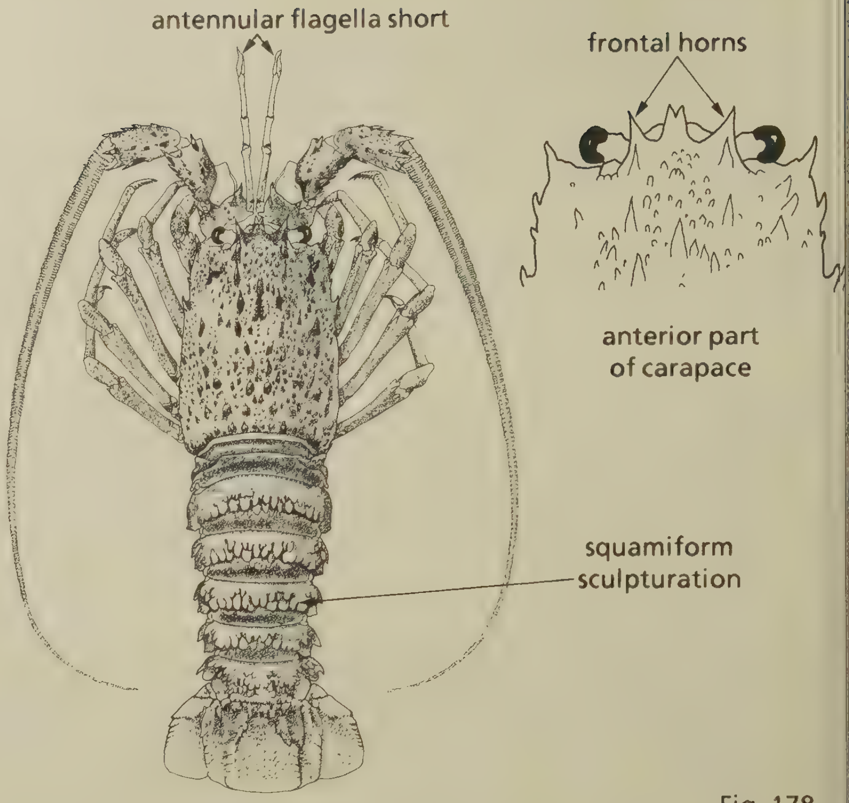
Fig. 177

4a. Abdominal segments usually with squamiform sculpturation before transverse groove; no distinct antennular plate between bases of antennae (Fig. 178) .... ***Jasus (Jasus)***

4b. Abdominal segments with a sometimes interrupted transverse groove, but without squamiform sculpturation; antennular plate between bases of antennae distinct or absent

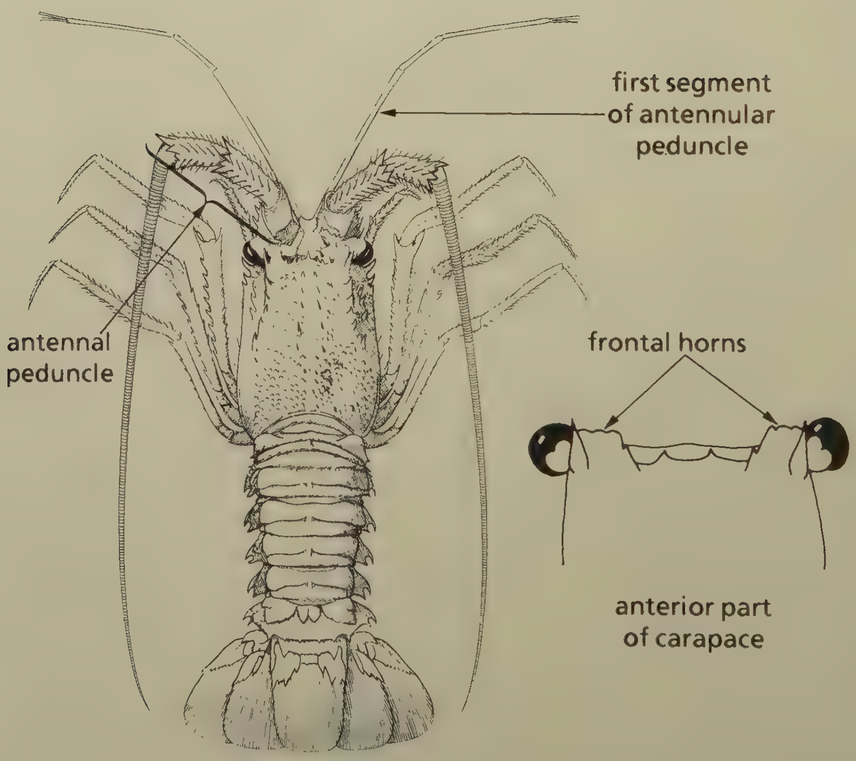
5a. Frontal horns truncated with anterior margin crenulate; first segment of antennular peduncle reaching beyond antennal peduncle (Fig. 179) .... ***Palinustus***

5b. Frontal horns tapering to a sharp point; first segment of antennular peduncle not over-reaching antennal peduncle


antennular flagella short
frontal horns
anterior part of carapace
squamiform sculpturation

Jasus (Jasus)

Fig. 178


first segment of antennular peduncle
antennal peduncle
frontal horns
anterior part of carapace

Palinustus

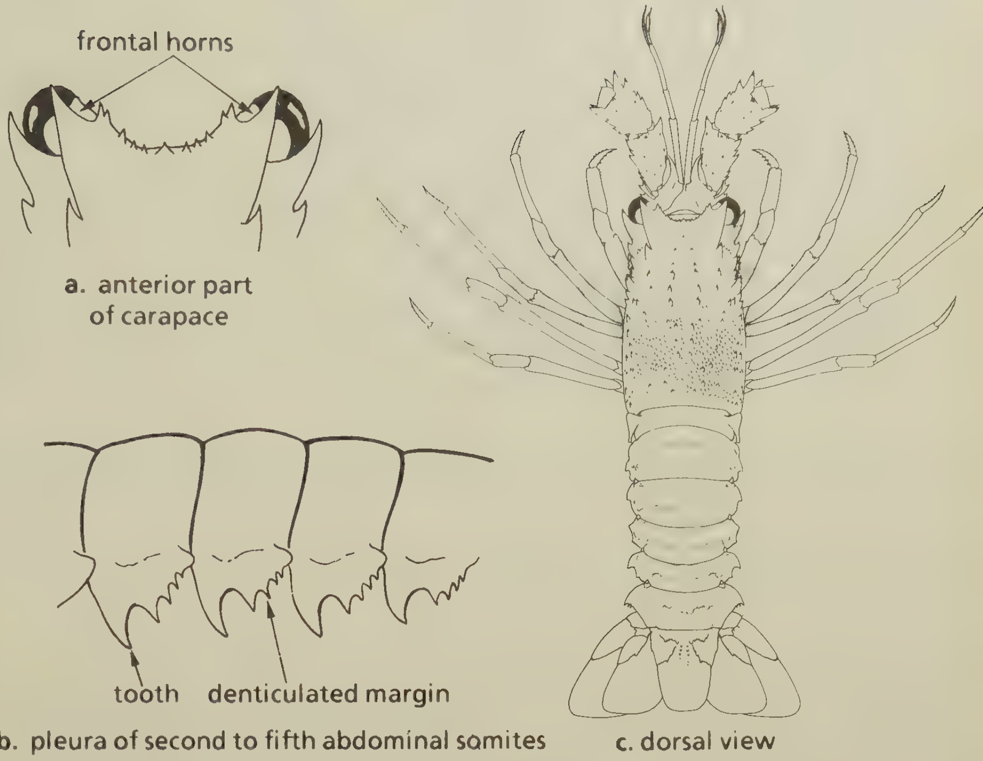
Fig. 179

6a. Anterior margin of carapace between frontal horns with about 10 small, sharp teeth (Fig. 180a); pleura of second to fifth abdominal somites with a strong anterior tooth followed by a lobe denticulated on the posterior margin (Fig. 180b) .... ***Palinurus*** (Fig. 180c)

6b. Anterior margin of carapace unarmed between frontal horns, except for the presence, in some species, of a small triangular rostrum and a small denticle near the base of the frontal horns (Fig. 181a). Pleura of second to fifth abdominal somites ending in two simple, strong, sharp teeth without denticles (Fig. 181b); only in ***Sagmariasus*** the second tooth is replaced by a denticulated lobe

7a. Antennular plate distinct, a stridulating organ present (Fig. 181a). Carapace with a median ridge behind the cervical groove, often with spines or tubercles, but without submedian rows (Fig. 181c) .... ***Puerulus***

7b. Antennular plate hardly, if at all, visible in dorsal view. Stridulating organ absent. Carapace behind cervical groove without a median ridge, but with two submedian ridges, each bearing a row of large, sharply pointed teeth or numerous spinules (Fig. 182)

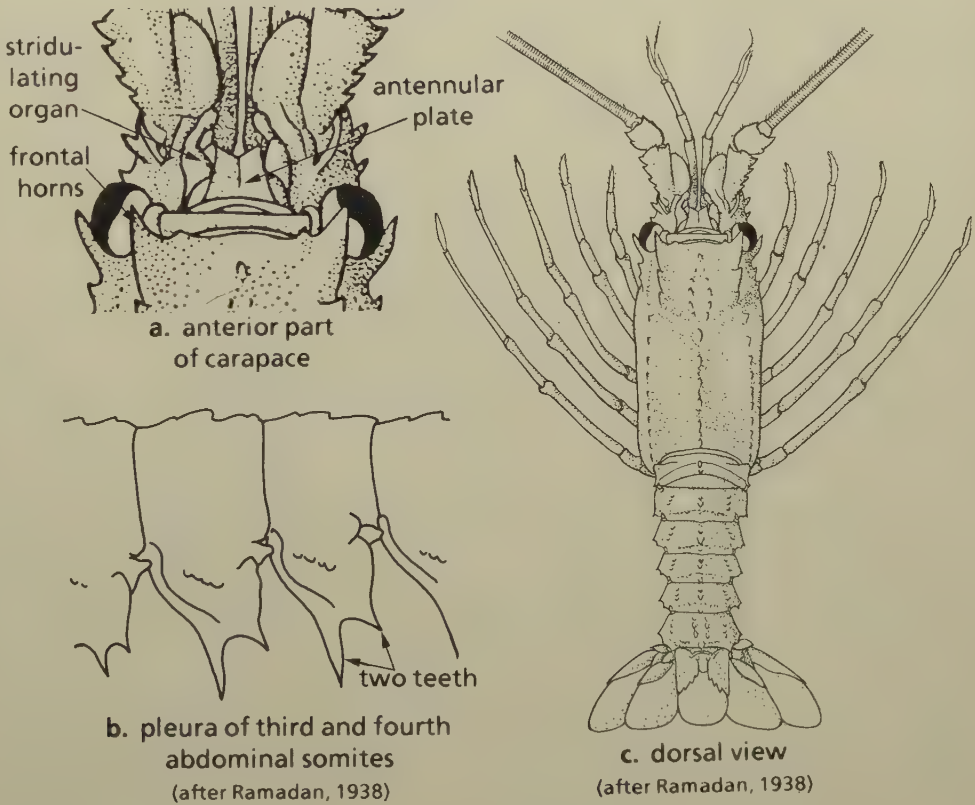


a. anterior part of carapace

b. pleura of second to fifth abdominal somites

c. dorsal view

Palinurus Fig. 180



a. anterior part of carapace

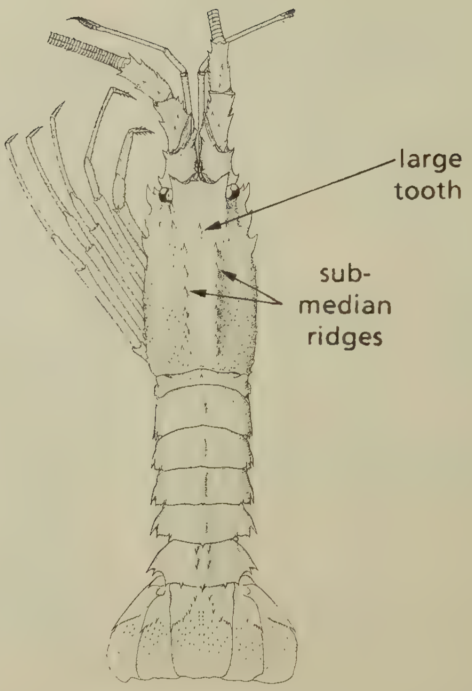
b. pleura of third and fourth abdominal somites (after Ramadan, 1938)

c. dorsal view (after Ramadan, 1938)

Puerulus Fig. 181

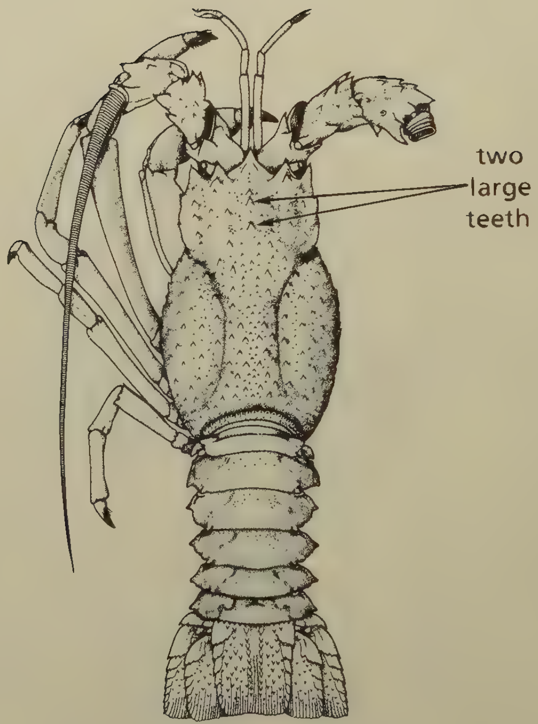
8a A large single median tooth before the cervical groove. Apart from two submedian and two lateral longitudinal rows of spines the posterior half of the carapace is smooth and without spinules (Fig. 182). Abdominal pleura ending in two single sharp teeth (Fig. 181b) .... ***Projasus***

8b. Two large median teeth before cervical groove. Posterior half of carapace closely set with numerous sharp spinules (Fig. 183). Abdominal pleura ending in a sharp anterior tooth and a broad, distinctly denticulate posterior lobe .... ***Jasus (Sagmariasus)***



Projasus
(from Webber & Booth, 1988)

Fig. 182



Jasus (Sagmariasus)
(from Kensler, 1967)
Fig. 183

Jasus Parker, 1883

PALIN Jas

Jasus Parker, 1883, Nature, London, 29:190. Gender masculine. Name placed on the Official List of Generic Names in Zoology in Opinion 612 (published in 1961).

Type Species : by selection by Holthuis (1960, Bulletin Zoological Nomenclature, 17:193): ***Palinurus lalandii*** H. Milne Edwards, 1837.

Synonyms : ***Palinosytus*** Bate, 1888, Report Voyage Challenger, Zool., 24:93. Type species, by selection by Holthuis (1960, Bulletin of Zoological Nomenclature, 17:193): ***Palinurus lalandii*** H. Milne Edwards, 1837. Gender masculine. Name placed on the Official Index of Rejected and Invalid Genus-Group Names in Zoology in Opinion 612 (published in 1961).

Palinostus Bate, 1888, Report Voyage Challenger, Zool., 24:56,76,85. An incorrect original spelling of ***Palinosytus*** Bate, 1888, and therefore unavailable. Name placed on the Official Index of Rejected and Invalid Genus-Group Names in Zoology in Opinion 612 (published in 1961).

The genus consists of seven species, all of which are of commercial interest, and live in restricted zones in the temperate area of the southern hemisphere.

The genus ***Jasus*** can be divided into two subgenera: the nominate subgenus, ***Jasus*** or "scalloped rock lobsters", includes all but one of the species, and is characterized by the scalloped sculpturation of the upper surface of the abdominal somites. The other subgenus is ***Sagmariasus*** nov. subgen. and includes as type and only species the Packhorse rock lobster, ***Jasus verreauxi*** (H. Milne Edwards). It is characterized by that the abdominal somites do not show any scalloped sculpturation.

Subgenus *Jasus* Parker, 1883

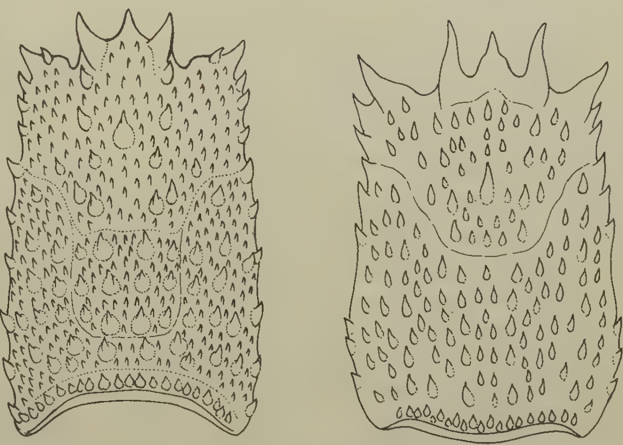
Six species are known in this subgenus.

Key to Species:

1a. Large spines of carapace broad and flattened, about as wide as long, and much larger than the small spines (Fig. 184a). Sculpturation of abdomen wide, with relatively few squamae, and with an extensive smooth area on the anterior part of each somite (Fig. 185a,b,c). Eastern Pacific, South Central Atlantic, Western Indian Ocean (exclusive of South Africa) .... ***"frontalis"*** subgroup

2a. First abdominal somite without any squamiform sculpturation. The following somites with only a single transverse row of large squamae before the transverse groove of the somite, sometimes with some very small squamae just before or just behind it. Posterior half of the abdominal somites behind the transverse groove without squamiform structures (Fig. 185a) (Juan Fernandez Island) .... ***J. frontalis*** (Fig. 189)

2b. First and following abdominal somites with a transverse row of squamiform sculpturation behind the transverse groove (Figs 185 b,c)



a. ***"frontalis"*** subgroup   b. ***"lalandi"*** subgroup

carapace (dorsal view)   Fig. 184

3a. Indian Ocean area (St. Paul and Amsterdam Islands, rarely at Kergueien). Frontal horns almost equilaterally triangular, shorter and broader than in ***J. tristani***. Squamiform sculpturation of the abdomen with the squamae narrower and more numerous than in ***J. tristani*** (Fig. 185b). .... ***J. paulensis*** (Fig. 195)

3b. South Atlantic Ocean area (Tristan da Cunha Archipelago, Gough Island, Vema Seamount). Frontal horns with the upper margin slightly more convex than the lower, more slender than in ***J. paulensis***. Squamiform sculpturation of the abdomen coarser than in ***J. paulensis*** with the squamae fewer and wider (Fig. 185c). .... ***J. tristani*** (Fig. 197)

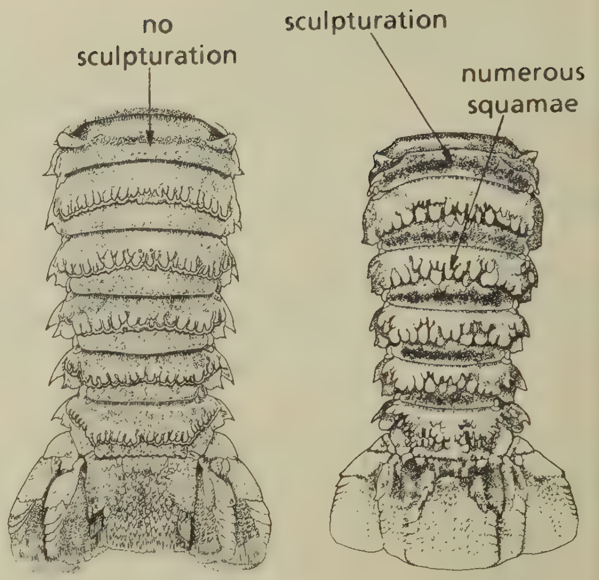
1b. The large spines of the carapace are narrow, often 3 or 4 times as long as wide and not very different from the small spines (Fig. 184b). The sculpturation of the abdomen is more dense, with relatively smaller squamae and a narrower smooth anterior area (Fig. 186a,b,c). South Africa, Australia, New Zealand .... ***"lalandii"*** subgroup

4a. Anterior half of first abdominal somite with a squamiform sculpturation both anteriorly and posteriorly of the transverse groove (Fig. 186a). South Africa ...... ***J. lalandii*** (Fig. 191)

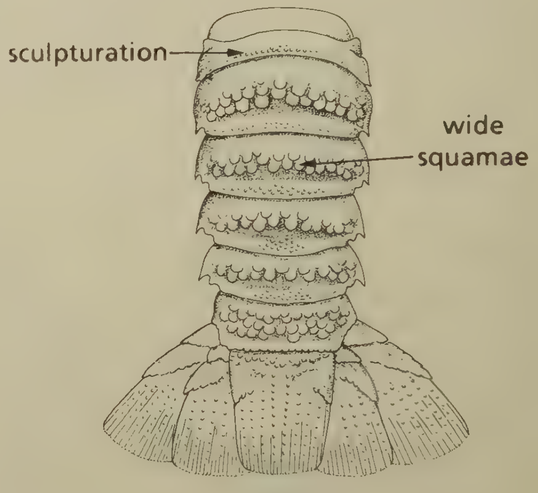
4b. Anterior half of first abdominal somite before the transverse groove entirely smooth, without sculpturation

5a. South and East Australia, Tasmania. The squamiform sculpturation on the posterior half of the second to fifth abdominal somites (behind the transverse groove) dense and covering the entire surface, the squamae arranged in 4 or 5 transverse rows (Fig. 186b). .... ***J. novaehollandiae*** (Fig. 193)

5b. New Zealand. The squamiform sculpturation on the posterior half of the second to fifth abdominal somites (i.e. the part behind the transverse groove) less dense, with larger squamae, which are arranged in 2 or 3 transverse rows (Fig. 186c) .... ***J. edwardsii*** (Fig. 187)

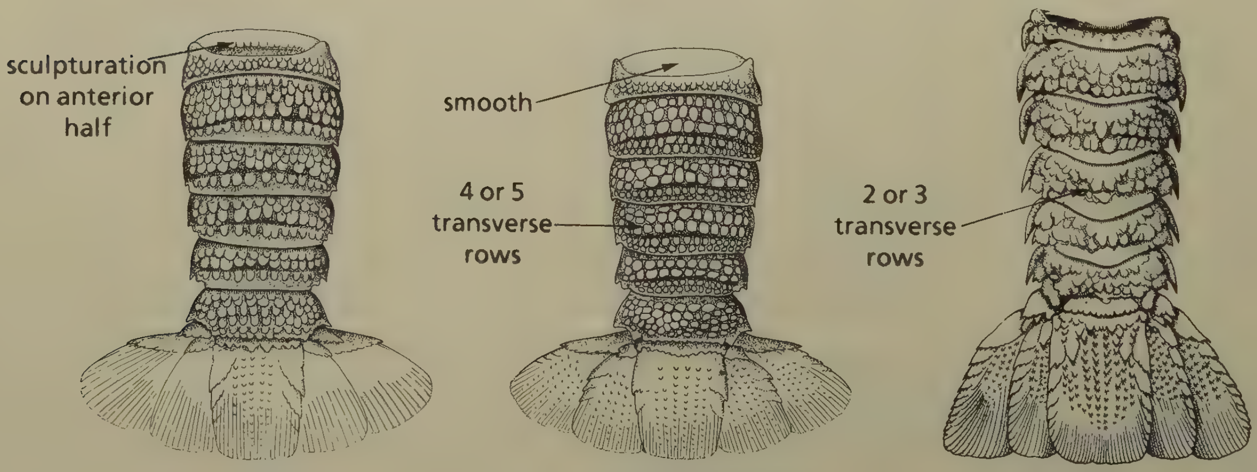


a. ***J. frontalis*** b. ***J. paulensis***



c. ***J. tristani***

abdomen (dorsal view) Fig. 185



a. ***J. lalandii*** b. ***J. novaehollandiae*** c. ***J. edwardsii***

abdomen (dorsal view) Fig. 186

Jasus (Jasus) edwardsii (Hutton, 1875)

PALIN Jas 2

Palinurus edwardsii Hutton, 1875, Transactions Proceedings New Zealand Institute, 7:279.

Synonyms : No synonyms known. The species for a long time has incorrectly been synonymized with ***J. lalandii*** (H. Milne Edwards).

FAO Names : En - Red rock lobster.

Type : Type locality: "Otago Heads" near Dunedin, South Island, New Zealand. Syntypes supposedly in DMW, now lost, at least not located in 1988

Geographical Distribution : All coasts of New Zealand, from Three Kings Islands (north west of the northern tip of North Island) south to the Auckland Islands, also found at the Chatham Islands; most common off the south west part of South Island, and the east coast south of East Cape (Fig. 188).

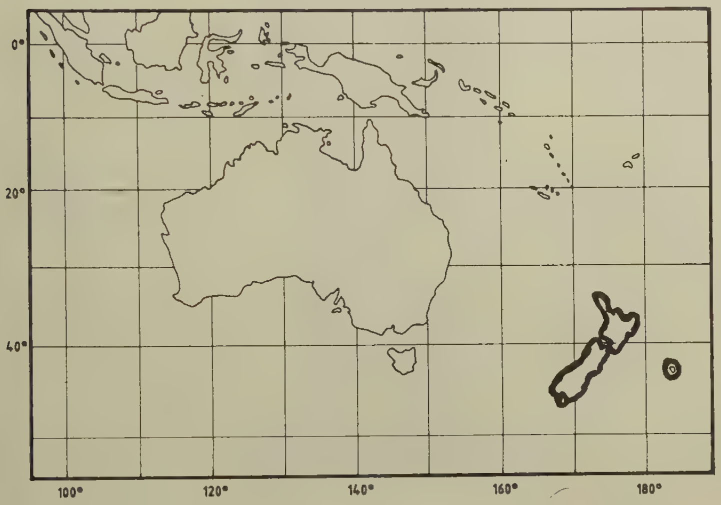
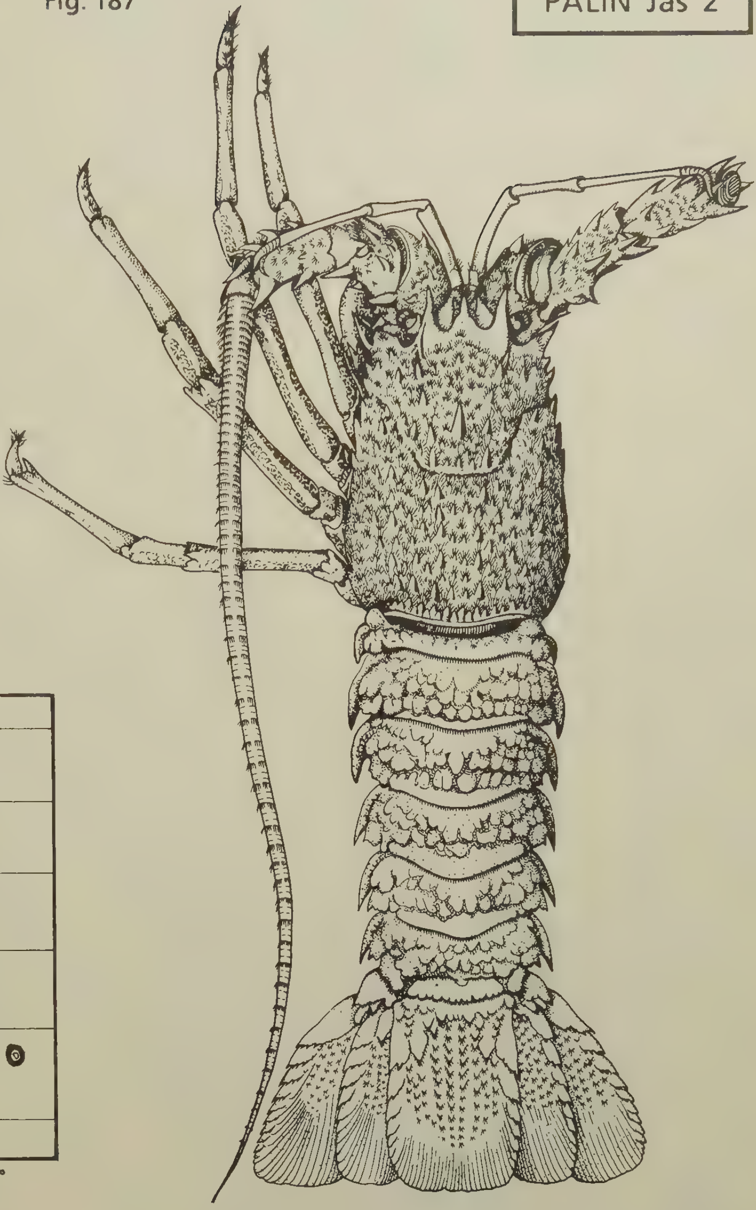


Fig. 188

Fig. 187



(from Kensler, 1967) Fig. 187

Habitat and Biology : The species lives in crevices of the rocky shores and among algae at depths between 5 and 200 m. Soft shelled specimen are occasionally caught in December and January.

Size : Maximum total body length is 58 cm (males), and 43 cm (females); maximum carapace lengths 23.5 cm (males), 18 cm (females); minimum legal carapace lengths 10 cm (males), and 9 cm (females).

Interest to Fisheries : The species is usually caught with baited lobster pots, sometimes obtained by trawling and by diving. Protective laws have been introduced, like size limits, prohibition of some gear, prohibition of taking ovigerous females or soft specimens, bag limits for sports fishermen, etc. The specimens are sold as frozen tails (mostly to the USA) and whole live specimens (mainly to Japan). According to FAO statistics, 5 000 tons were caught in 1987 and 1 242 tons in 1988. According to Kensler (1969:516) this species sustains "New Zealand's main and most valuable export fishery". It represents 99% of the total lobster fishing in the area (the other 1% is formed by ***J. verreauxi***). In 1988 the species represented the fourth most valuable fishery of New Zealand, after the fishes Orange Roughy (***Hoplostethus atlanticus***), Hoki (***Macruronus novaezelandiae***), and squid (Booth, in litt.). Since 1965, the species is also commercially fished at the Chatham Islands. The Chatham fishery expanded rapidly since 1966 and in 1967 provided about 50% of the total New Zealand catch.

Local Names : NEW ZEALAND: Red crayfish, Red spiny lobster, Common crayfish, Marine spiny crayfish, Rock lobster, Southern crawfish, Spiny crayfish; Koura (Maori language).

Literature : Kensler, 1968:81-89; Kensler, 1969:506-517; Williams, 1986:13, figs 26, 78d-e.

Jasus (Jasus) frontalis (H. Milne Edwards, 1837)

PALIN Jas 3

Palinurus frontalis H. Milne Edwards, 1837, Histoire naturelle des Crustacés, 2:294.

Synonyms : *Palinostus frontalis* - Bate, 1888. The species has often, incorrectly, been synonymized with *J. lalandii.*

FAO Names : **En** - Juan Fernandez rock lobster; **Fr** - Langouste Juan Fernandez; **Sp** - Langosta de Juan Fernández.

Type : Type locality: "Habite le Chili", now restricted to Juan Fernandez Archipelago, Chile. Type material in MP, no longer extant (not found in 1989).

Geographical Distribution : The range of the species is restricted to: (1) the waters around the Juan Fernandez Archipelago, 33°35'-33°49'S 78°45'-80°49'W: Isla Robinson Crusoe (= Isla Más a Tierra), Isla Marinero Selkirk (= Isla Alejandro Selkirk, = Isla Más Afuera) and Isla Santa Clara, and (2) the waters around the Islas Desventuradas, 26°17'-26°22'S 79°50'-80°6'W: Isla San Felix and Isla San Ambrosio (Fig. 190).

Habitat and Biology : A species inhabiting a rocky and partly sandy environment at depths of 2 to 200 m. Water temperature between 13° and 19°C. Eggs spawned between August and November and carried for about 11 months. Although there is some migration to deeper waters from the end of September onwards, the species never disappears completely from the coast. In January, the migration back to shallow waters starts. The food consists of algae, smaller and larger molluscs and crustaceans, and dead animal matter of any kind. The species is predated by various fishes.

Size : Maximum body length 48 cm (males) and 46 cm (females), carapace length 22 cm (males) and 19 cm (females). Reports of total body lengths of 60-70 cm have to be considered with much reserve.

Fig. 189

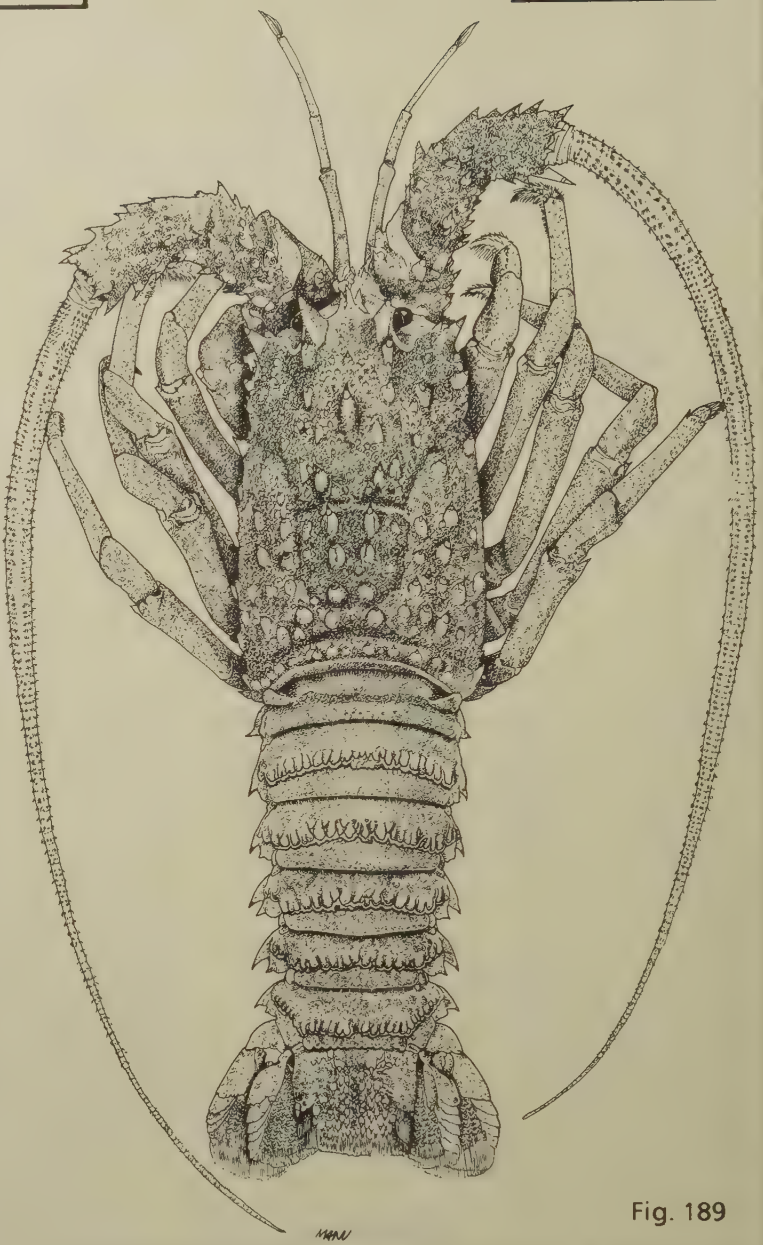


Fig. 189
(combined from Holthuis & Sivertsen, 1967 and Pizarro & Tiffon, 1974)

Interest to Fisheries : The early navigators who visited Juan Fernandez like Jacob Roggeveen in 1722 and George Anson in 1741 already mentioned that the lobsters were found there "in such abundance near the water's edge [of Isla Robinson Crusoe] that the boat-hooks often struck into them, in putting the boats to and from the shore" (Walter, 1776:125, 126), also their excellent quality as food was commented upon. Molina (1808: 144; English translation of Molina's original (1782) Italian edition) mentioned that "Lobsters are also found in such quantities ... that the fishermen have no other trouble to take them, than to strew a little meat upon the shore, and when they come to devour this bait, as they do in immense numbers, to turn them on their backs with a stick. By this simple method many thousands are taken annually, and the tails which are in high estimation, dried and sent to Chili". Albert (1898:6) mentioned that the species was usually fished at depths between 7 and 14 m. Skottsberg (1956:178), almost 50 years later, stated that "nowadays the best catch is made in depths from 40 to 80 meters". Evidently, the intensity of fishing drove the species to deeper water, and the easy method of picking them by hand was replaced by lobster pots.

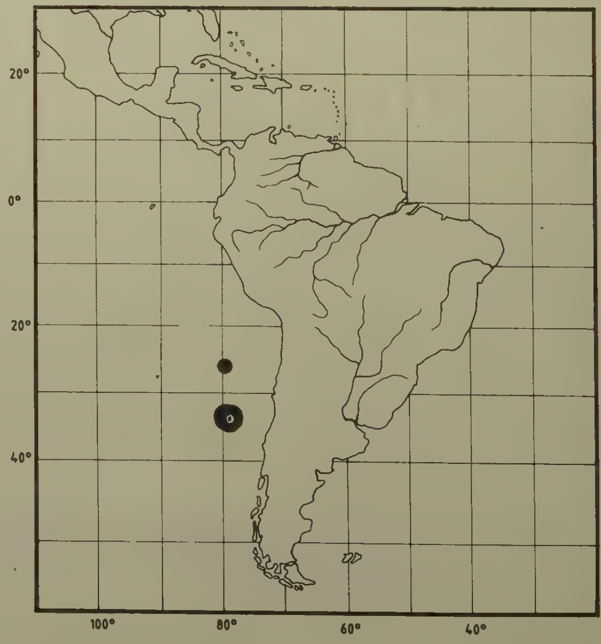


Fig. 190

By the end of the 19th century, canning lobster tails was tried without too much success; canned and live lobsters were then exported to Chile. In 1970, the main gear for catching the lobsters were lobster pots and they perhaps still are. Evidently, most lobsters are exported live to the mainland. According to FAO statistics, the annual catch of the species was 36 tons in 1987 and 29 tons in 1988. The fishery is of the greatest importance in the Archipelago and gives employment to a large part of the population. Experimental work on reproduction and development in captivity of this species is being conducted in Chile.

Protective measures are in force and well adhered to: (1) the minimum legal size is a carapace length of 11.5 cm, (2) ovigerous females have to be put back into the sea, (3) the season is closed from 15 May to 30 September.

Local Names : CHILE: Langosta de Juan Fernández, Langosta de tiempo (for larger forms).

Literature : Holthuis & Sivertsen, 1967:25-32, pl. 5; Arana Espina et al., 1971-1973; Pizarro et al., 1974; Pavez Carrera et al., 1974; Retamal, 1977:13-14, fig. 5; Williams, 1986:13, fig. 27.

Jasus (Jasus) lalandii (H. Milne Edwards, 1837)

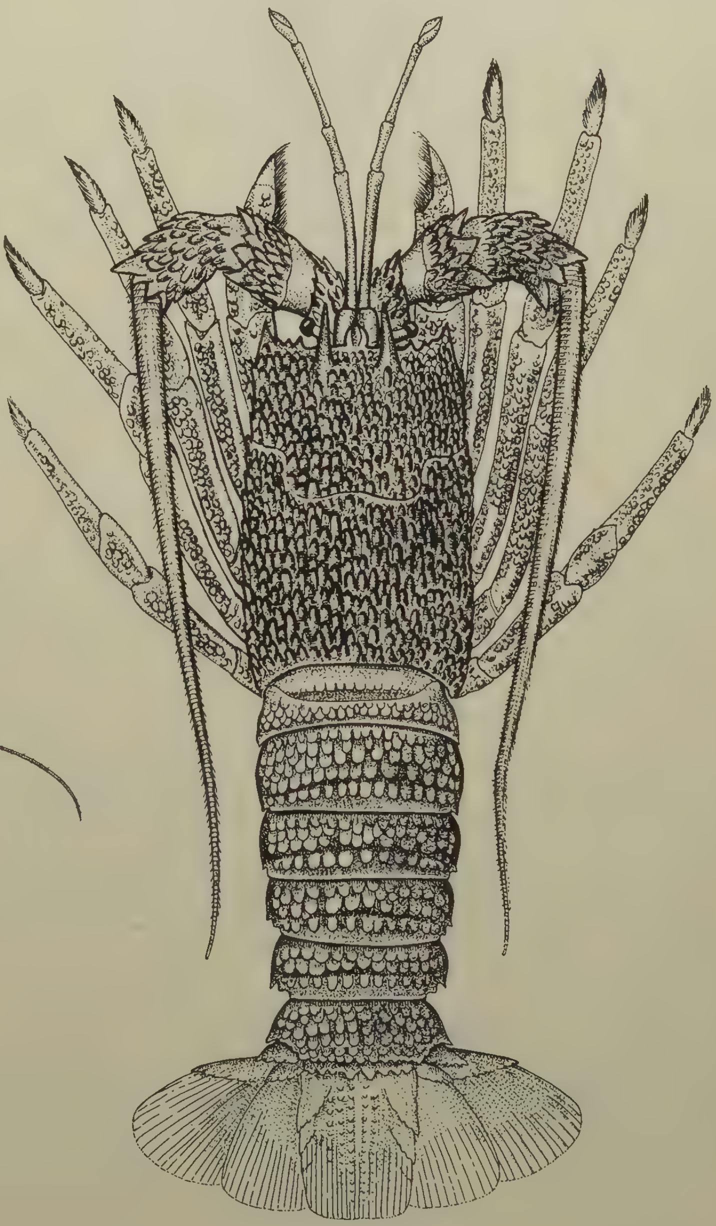
Fig. 191

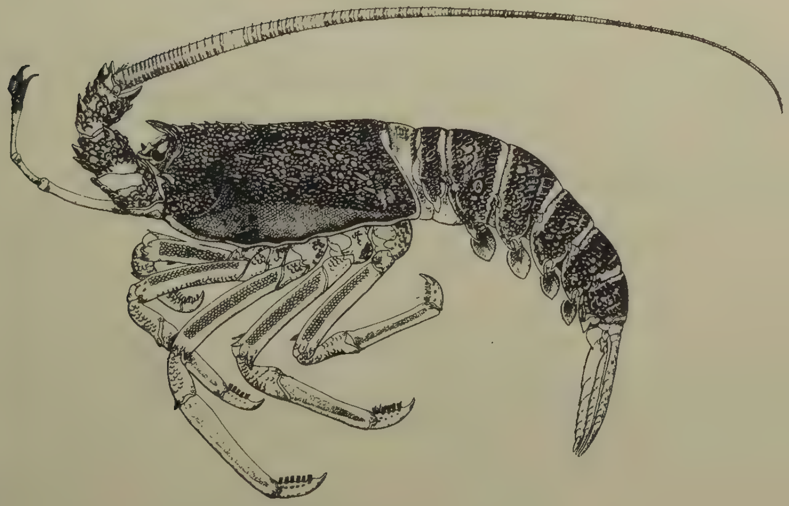
PALIN Jas 4

Palinurus lalandii H. Milne Edwards, 1837, Histoire naturelle des Crustacés, 2:293. Name placed on the Official List of Specific Names in Zoology in Opinion 612 (published in 1961).

Synonyms : ***Palinostus lalandii*** - Bate, 1888; ***Palinosytus lalandii*** - Stebbing, 1893. The question whether the specific name should be written ***lalandii*** or ***lalandei*** (named for Pierre de la Lande) has been definitely settled in favour of ***lalandii*** by the International Commission on Zoological Nomenclature in their Opinion 612. The specific name ***lalandii*** has, at times, been used for other species of the subgenus ***Jasus***.

FAO Names : **En** - Cape rock lobster; **Fr** - Langouste du Cap; **Sp** - Langosta del Cabo.





lateral view (from Paterson, 1968)

dorsal view

Fig. 181

Type : Type locality: "Habite les côtes du cap de Bonne-Espérance" (= Cape of Good Hope, South Africa). Type material in MP: 2 dry syntypes, the larger (410.mm) in good, the smaller (370 mm), in reasonable condition. The larger, no Pa. 437, chosen as the lectotype; the smaller, no. Pa.433, then becomes paralectotype.

Geographical Distribution : Restricted to southern Africa from Cape Cross, South West Africa (Namibia) at 21°43'S 13°58'E; around the Cape of Good Hope to Algoa Bay, Cape Province at 33°50'S 25°50'E (Fig. 192).

Habitat and Biology : The species lives in coastal waters at depth between 0 and 46 m, on rocky bottoms, sometimes with patches of sand and mud. The males moult between September and December. In the females, moulting occurs in April or May, after which copulation takes place. Ovigerous females are found from May to October.

Size : Maximum total body length 46 cm, carapace length 18 cm.

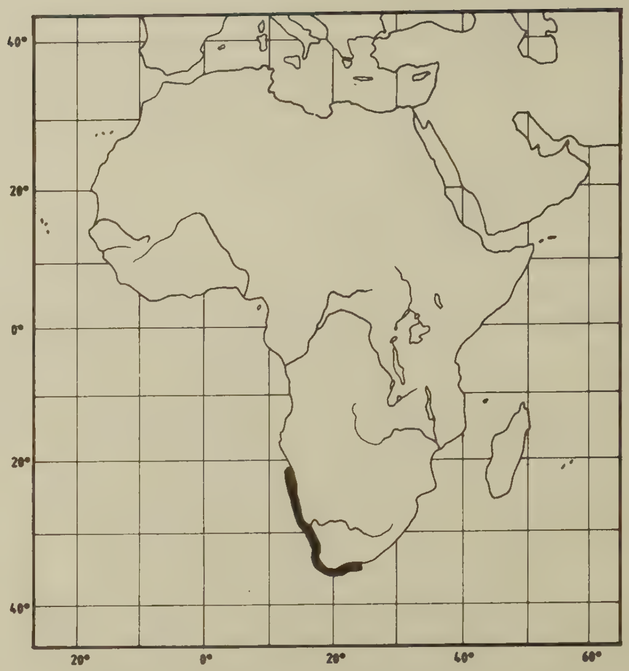


Fig. 192

Interest to Fisheries : The fishery for ***Jasus lalandii*** is of great importance throughout its range. According to FAO statistics, the catches amounted to 6 689 tons in 1987 and 6 820 tons in 1988. The fishery is carried out with lobster pots and hoop nets. The catch is sold fresh or cooked in local markets. Tails are exported frozen in the shell, or peeled and canned. Experimental work on culture techniques for this species are underway in South Africa.

Protective measures for the species include a size limit (carapace length 8.5 cm), a closed season from 1 July to 31 October, bag limits for sportsfishermen (2 specimens per day), and the prohibition of taking ovigerous females or soft-shelled specimens.

Local Names : FRANCE: Langouste du Cap; GERMANY: Kaplanguste, Afrikanische Languste, Rote languste; SOUTH AFRICA: Cape crawfish, Cape crayfish, Cape spiny crayfish, Cape rocklobster, Cape spiny lobster (English); Kaapse kreef, Kreef (Suidafrikaans); UK: South African rock lobster, Cape spiny lobster.

Literature : Barnard, 1950:538-540, fig. 101a, b; Williams, 1986:12, figs 24, 78a-b.

Jasus (Jasus) novaehollandiae Holthuis, 1963

Fig. 193

PALIN Jas 5

Jasus novaehollandiae Holthuis, 1963, Proceedings Koninklijke Nederlandse Akademie Wetenschappen, (C)66:56.

Synonyms : In the literature prior to 1963 the species was usually indicated as ***Jasus lalandii,*** as it was not distinguished from the Cape rock lobster.

FAO Names : En - Southern rock lobster;

Type : Type locality: "Off the coast of New South Wales near Maroubra, Sydney", east coast of Australia. Holotype male in RMNH, no. D10642; paratypes in AM.

Geographical Distribution : Australia: from Cape Naturaliste, Western Australia (at about 33°S; with a few records as far north as Dongara at 29°15'S), along the entire coast of South Australia, Tasmania and Victoria to southern New South Wales (with a few records as far north as Sydney (33°53'S) and Port Stephens (at 32°42'S) (Fig. 194).

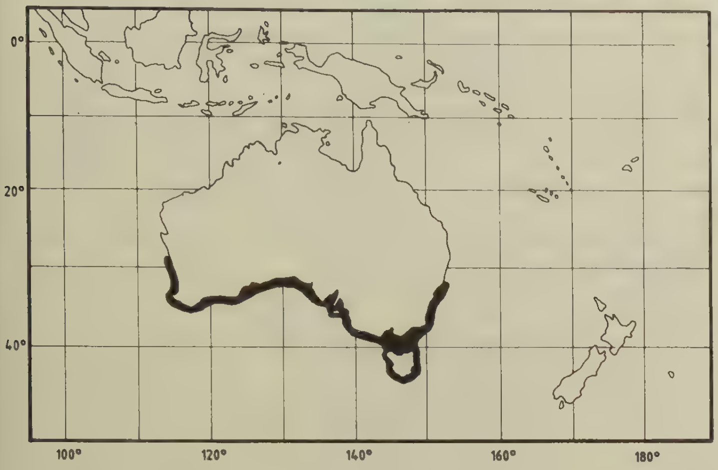
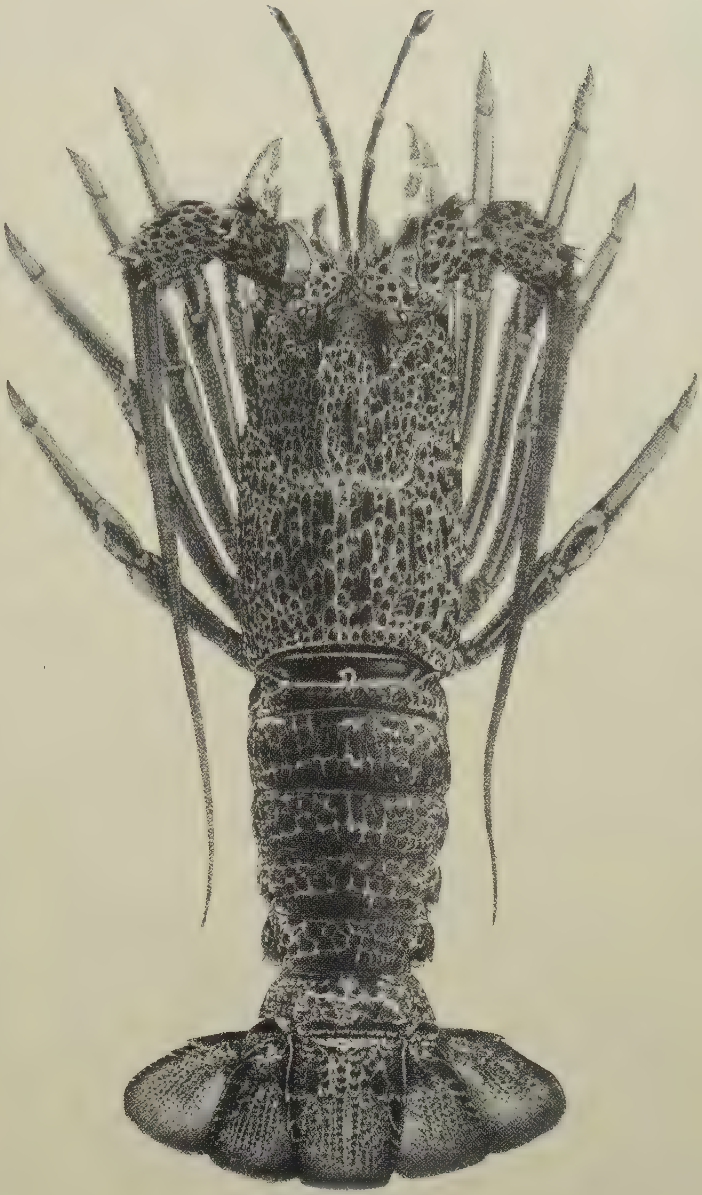


Fig. 194

Habitat and Biology : Depths range from 0 to 90 m (seldom 150 m); on a rocky substrate, especially on rocky onshore and offshore reefs with sufficient hiding places. Mating and egg-laying occurs from May to July after the moult of the female; hatching between July and December or even later. The pueruli settle between May and September. The species is gregarious and nocturnal. It is carnivorous and feeds on small crustaceans, molluscs and echinoderms.

Size : Maximum total body length about 51 cm, maximum carapace length about 20 cm. Ovigerous females about 5 to 16 cm carapace length.



(from McCoy, 1887) Fig. 193

Interest to Fisheries : The species is fished for throughout its range. Before 1916, about 90% of the animals were caught in depths less than 20 m, while in 1925 fishing was carried out in depths of 65 m. Around 1966 the annual catch of the species was about 5 500 tons. Recent FAO statistics do not mention the species and it is likely that its catches have been mistakenly added to those of ***Jasus verreauxi*** (q.v.). Fished mostly with baited traps (lobster pots, beehive pots, or cray pots) and hoop nets. The animals are marketed fresh on local markets, cooked whole or as tails on markets farther away, and exported as frozen tails, mainly to the USA.

Local Names : AUSTRALIA: Southern rock lobster (official Australian name), Cray, Red lobster, Southern crawfish, Southern (marine) crayfish, Southern spiny lobster, Tasmanian crayfish, Tasmanian lobster, Melbourne crayfish (name given to the species by the fishmongers; see McCloy, 1887:142).

Literature : McCoy, 1887:(15)189-93, pls 149, 150 (as ***Palinurus lalandi***); Hale, 1927:65-70, figs 62-7; Williams, 1986:13, figs 25,78c

Jasus (Jasus) paulensis (Heller, 1862)

Fig. 195

PALIN Jas 1

Palinurus paulensis Heller, 1862, Verhandlungen zoologisch-botanischen Gesellschaft Wien, 12:525.

Synonyms : The species has often been synonymized with ***Jasus lalandii***, and reported upon under that name (or as ***Palinurus lalandii***).

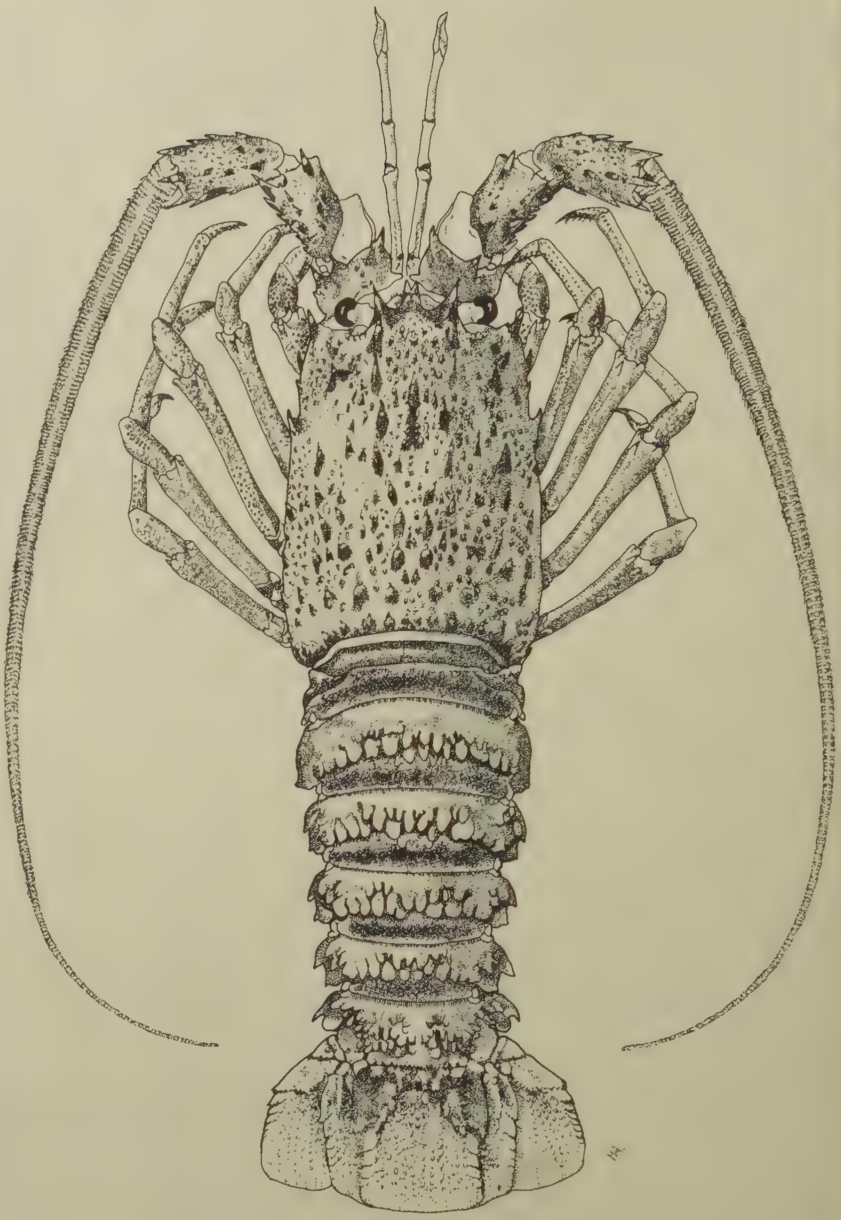
FAO Names : En - St.Paul rock lobster; **Fr** - Langouste de St. Paul; **Sp** - Langosta de St. Paul.

Type : Type locality: "St. Paul", [=St. Paul Island in the southern part of the Western Indian Ocean, at 38°44'S 77°30'E]. Syntypes in NMW.

Geographical Distribution : The species is restricted to St. Paul and Amsterdam Islands in the southern Indian Ocean (Fig. 196). A report of the catch of a single lobster in Kerguelen Islands by Aubert de la Rüe (1954:119) seems very reliable and is well documented (the specimen was brought up with algae entangled in the anchor of the ship "Lozère", a catch witnessed by A. Berland); but this evidently is a freak occurrence, as no lobster catches have been reported from the Kerguelen either before or after this event.

Habitat and Biology : The species lives at depths between 0 and 60 m, on rocky or gravel bottom, being most numerous in the kelp zone between 10 and 35 m. Egg-laying starts in May, and ovigerous females have been observed until November, or exceptionally early December. Females are caught from May to October, while males dominate in most catches from November to April The animals are nocturnal and feed on plants and (dead) animal matter.

Size : The largest specimen ever recorded had a total body length of 37 cm. Males have been reported to attain total body lengths of 14 to 34 cm (carapace length 6 to 13 cm), and females, total body lengths of 9 to 24 cm (carapace lengths 4 to 9 cm). The average sizes are 21 to 28 cm (males), 19 to 21 cm (females). The specimens from Amsterdam Island on the average are slightly smaller than those from St. Paul Island.



(after Holthuis & Sivertsen, 1967)

Fig. 195

Interest to Fisheries : The fishing grounds are restricted to the islands of St. Paul and Amsterdam, the shorelines of which are respectively 12 and 27 km long, and the area in which the species can be fished is less than 1 km wide. Early visitors of the then uninhabited islands caught the lobsters by hand in very shallow water. In the crater lake of St. Paul, which is a bay opening to the sea, the lobsters could be brought to the hot springs in the crater bottom without taking them out of the water, and cooked there. In 1928, a rather large fishing enterprise was started with lobster pots. The settlement on St. Paul consisted of a canning factory and the houses for the fishermen and employees of the factory, about 120 people in all. In 1931, the project was abandoned because of health conditions (a beri-beri epidemic). Later attempts (1938-1939, 1948-1949, 1949-1950) with factory ships were also unsuccessful. In 1950, a new French factory ship, the SAPMER, equipped with deep-freeze installations, operated near the islands. The lobsters were headed, washed and frozen on board. Six "campagnes" were carried out between 1950 and 1956, each providing between 214 and 255 tons of lobster tails (the equivalent of 5 000 tons of whole lobsters). Fear for overfishing made that several protective measures have been suggested.

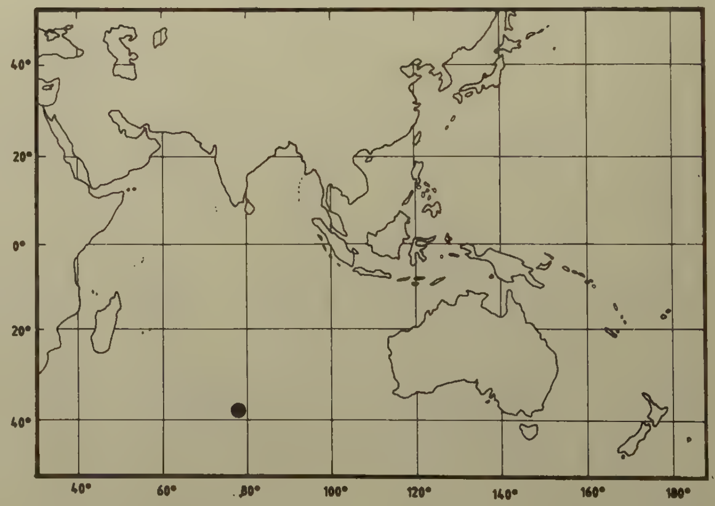


Fig. 196

Local Names : FRANCE: Langouste australe; USA: St.Paul spiny lobster.

Literature : Grua, 1960:15-40, figs 1-4; Grua, 1963:1-35, figs 1-2, 1-14; Holthuis & Sivertsen, 1967:18-25, pl. 4; Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986:14, fig. 29.

Jasus (Jasus) tristani Holthuis, 1963

Fig. 197

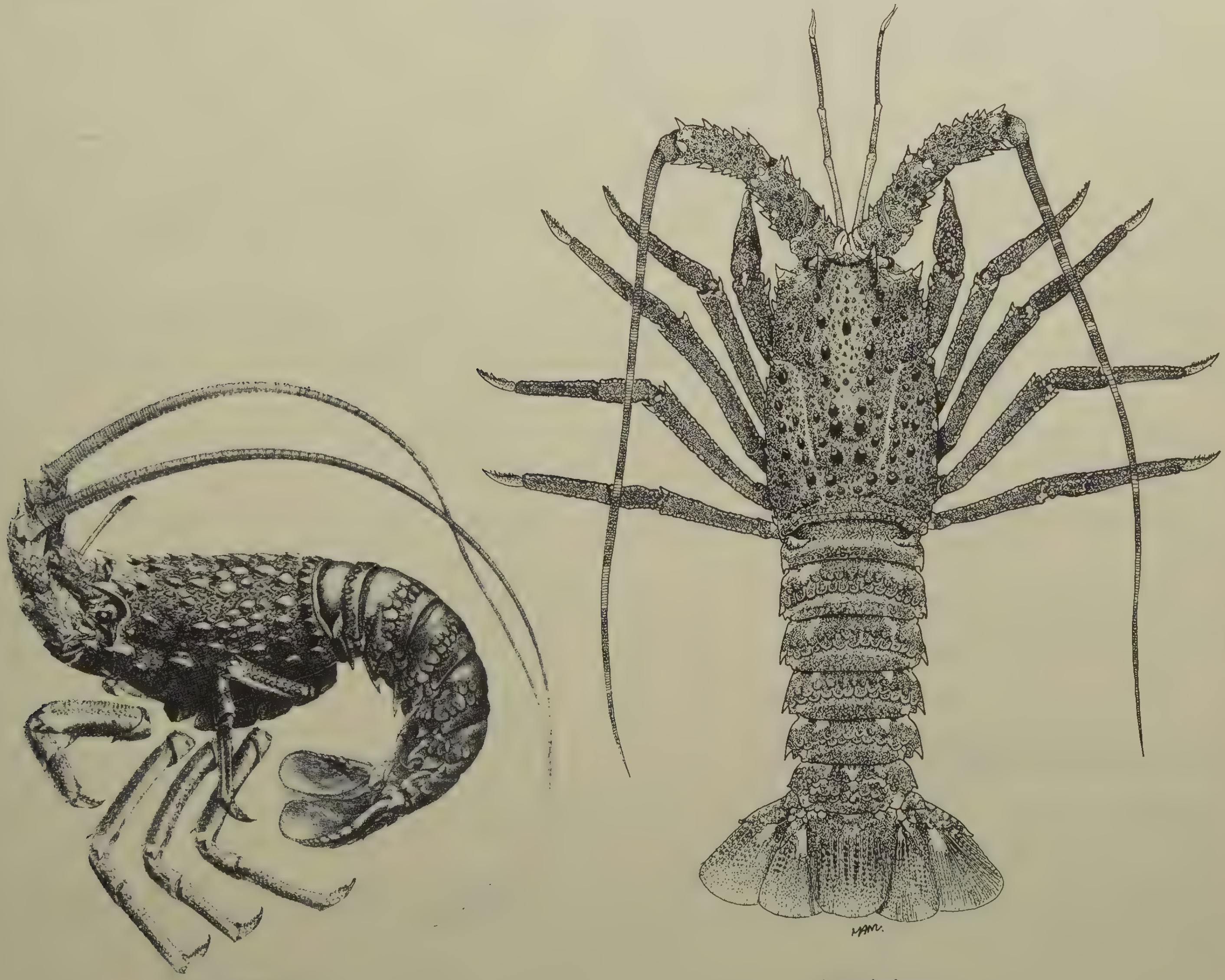
PALIN Jas 6

Jasus tristani Holthuis, 1963, Proceedings Koninklijke Nederlandse Akademie Wetenschappen, (C)66:57.

Synonyms : In older literature the species is sometimes referred to as ***Jasus*** (or ***Palinostus,*** or ***Palinosytus***) ***lalandii***.

FAO Names : En - Tristan rock lobster; **Fr** - Langouste de Tristan; **Sp** - Langosta de Tristan.

Type : Type locality: "Tristan da Cunha", in net off beach. Male holotype in MT; paratypes in MT, RMNH.



dorsolateral view

(after Bate, 1888)

dorsal view

(after Holthuis & Sivertsen, 1967)

Fig. 197

Geographical Distribution : Southern Atlantic Ocean. On the shelf of the islands of the Tristan da Cunha group (viz., Tristan da Cunha, Inaccessible Island, Nightingale Island, and Gough Island), as well as on Vema Sea Mount, 1 680 km ENE of Tristan da Cunha (Fig. 198).

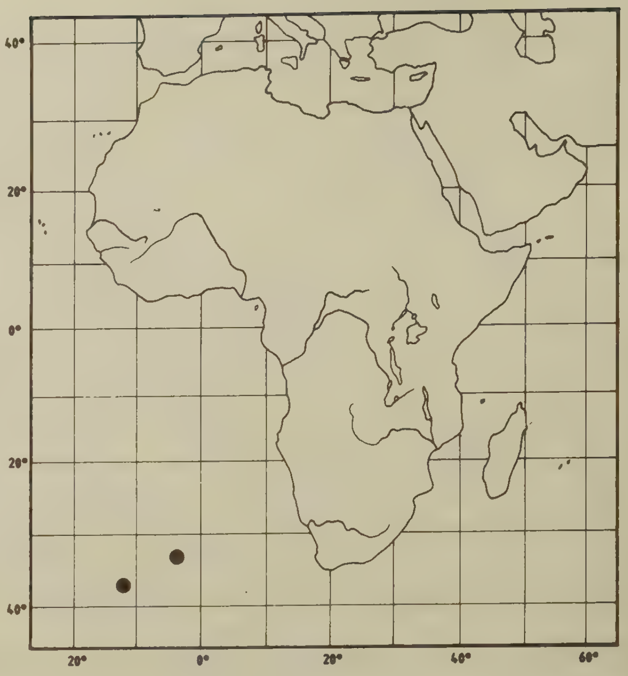


Fig. 198

Habitat and Biology : Depth range from 0 to 200 m; the greatest concentration of animals occurs between 20 and 40 m. The species is found on rocky bottoms, sometimes with gravel or shells, in the kelp zone. Ovigerous females were taken in September.

Size : Maximum total body length, 35.5 cm (males), and 27 cm (females); maximum carapace length, 14.5 cm (males) and 10 cm (females). Average carapace length, 8 to 9 cm. Pueruli are 2 to 3 cm in length.

Interest to Fisheries : Until about 1950, the fishery of the species was oriented almost exclusively towards local consumption. But in 1949, a Tristan da Cunha Exploration (later: Development) Company was founded and the lobster fishery was developed on a commercial basis; a cold storage and a canning plant were built, and one fishing vessel was operated.

Diesel-powered dinghies were used to bring the catch to the mother vessel for cold storage and subsequent delivery to the factory. The volcanic eruption of 1961 destroyed the shore installations and the company, which had not been very successful anyhow, was liquidated in 1962. In 1963, a new fishing company, the South Atlantic Islands Development Corporation, started operations after the islanders had returned to Tristan da Cunha. A harbour was built and in 1966 a new factory was established. Two fishing vessels with refrigeration facilities on board, worked with a number of dinghies, and resumed fishing operations in 1963. Later the larger fishing vessels were modernized, and the fleet was enlarged in 1971 to 4 vessels with facilities on board for heading the lobsters and freezing the tails. The number of vessels was again reduced in 1978, when there were again two. They were based in Cape Town and operated near the Inaccessible, Nightingale and Gough Islands. They used dinghies and later motorboats to put out and retrieve the nets and traps. From Tristan da Cunha Island, the dinghies and motorboats worked from the shore, the catch being processed in the factory there.

The gear used in the early days was a piece of bait on a long string and weighted with a stone. The bait was lowered into the sea and after a few minutes hoisted to the surface. The lobsters clinging to the bait (often like "a bunch of grapes") were then taken. Later, the dinghies and motorboats used hoop-nets and since 1967, metal traps on long lines. The inclement weather conditions allow only about 70 fishing days a year.

The yield in 1960-1961 was 52.5 tons of tails. Pollock (1981:49) estimated total annual yield at 500-800 tons. FAO statistics give the annual catch for 1987 as 405 tons, and for 1988 as 441 tons.

Local Names : TRISTAN DA CUNHA (UK): Crawfish, Tristan crawfish, Tristan da Cunha crayfish, Tristan da Cunha spiny lobster.

Literature : Holthuis & Sivertsen, 1967:7 18, text-figs 1, 2, pls. 1-3; Roscoe, 1979:1-47, figs 1-3; Pollock, 1981:49-66, figs 1-11; Williams, 1986:14, fig. 28.

Subgenus *Sagmariasus* nov.

Type species : ***Palinurus verreauxi*** H. Milne Edwards, 1851. Gender masculine.

This new subgenus of the genus ***Jasus*** differs from the nominotypical subgenus by the absence of any sculpturation on the abdomen: the characteristic scalloped pattern found in all species of ***Jasus*** s.s. is completely lacking here. Furthermore, the rostrum of ***Sagmariasus*** is as large and strong as the frontal horns and is of the same shape, forming with the frontal horns a tridentate plate. In ***Jasus*** s.s. the rostrum is a small spine, much smaller than the frontal horns and placed on a much lower level. In ***Sagmariasus*** the antennulae are much less slender than in ***Jasus*** s.s.

The new subgenus includes a single species, ***Jasus (Sagmariasus) verreauxi*** (H. Milne Edwards, 1851), which is its type.

Derivatio nominis: the greek word Sagmarion, meaning packhorse, is combined here with Jasus. The name alludes to the vernacular name "Packhorse crayfish" given in New Zealand to large specimens of the type species. The derivation of the generic name ***Jasus*** has not been given by its author, but it may refer to Iasus, the latin name of a locality in Asia Minor west of the town of Milas in south west Turkey (37°19'N 27°48'E).

Jasus (Sagmariasus) verreauxi (H. Milne Edwards, 1851)

Fig. 199

PALIN Jas 7

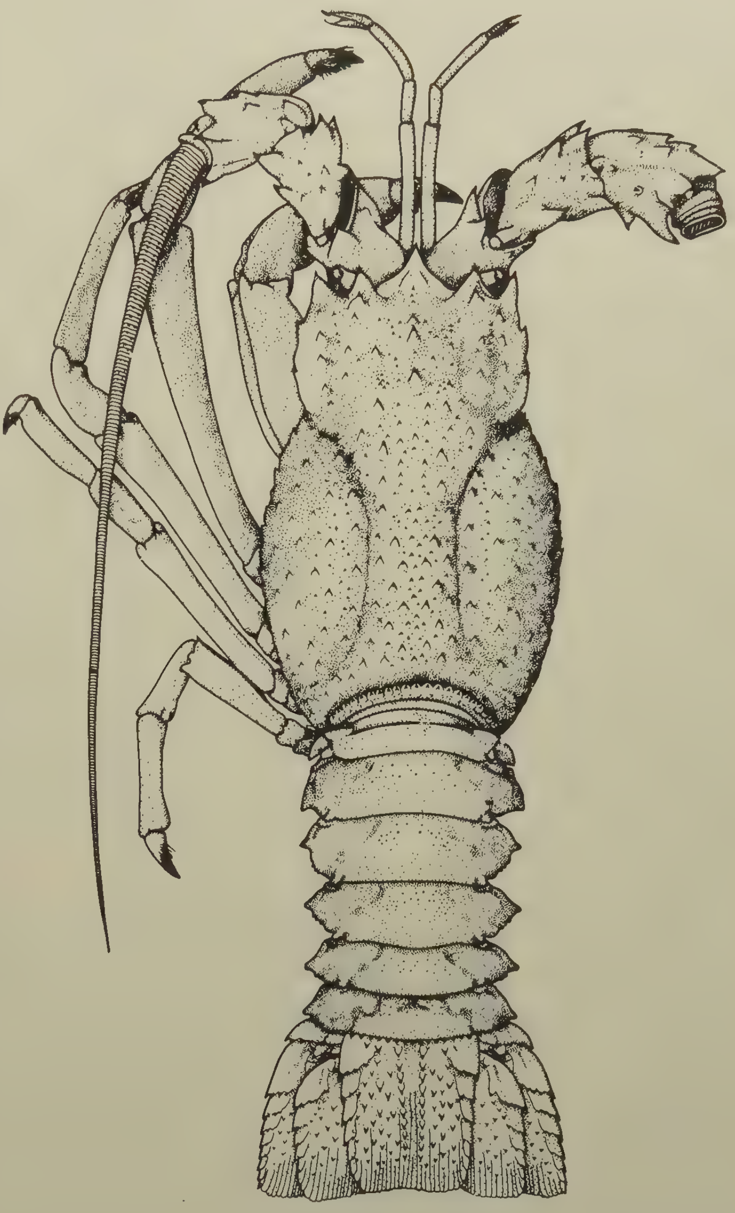
Palinurus verreauxi H. Milne Edwards, 1851, Annales Sciences Naturelles, Paris, Zool., (3)16:255, 290, pl. 8 fig. 15.

Synonyms : ***Palinurus huegelii*** Heller, 1862; ***Palinurus tumidus*** Kirk, 1880; ***Palinurus giganteus*** Kirk, 1880; ***Jasus huegelii*** - Ortmann, 1891; ***Palinosytus huegelii*** - Stebbing, 1893.

FAO Names : **En** - Green rock lobster; **Fr** - Langouste d'Océanie; **Sp** - Langosta de Oceanía.

Type : Type locality of ***Palinurus verreauxi***: not mentioned in the original description but Gruvel (1911:15) made clear that H. Milne Edwards' type material came from New South Wales, Australia and is in MP, evidently no longer extant (not located in 1989).

The type locality of ***Palinurus huegelii***: "wurde von Baron Hügel im indischen Ocean gesammelt" (Heller, 1862:393). This information is obviously erroneous as the species does not occur in the Indian Ocean. Karl Alexander Anselm Freiherr von Hügel, baron of the German Empire (born in Regensburg (= Ratisbon), Bavaria, 25 April 1795, died in Brussels, Belgium, 2 June 1870) spent most of his youth in Austria and was in the service of the Austrian government until his retirement in 1867. Being much interested in horticulture and natural history, he travelled between 1830 and 1836 to England, France and India. He left India in September 1833 and then visited the Philippines, Malaysia, the Netherlands East Indies, the South Pacific but also "the Swan river, King George's Sound, and Sydney in Australia; Van Diemen's Land [= Tasmania], New Zealand, Norfolk Island" (A. von Hügel, 1903:73). His visits to New Zealand and Australia took place between September 1833 and 6 October 1834, at the last mentioned date he left Sydney for the Philippines, from where he returned home via China, Malaysia and India. The type of ***Palinurus huegelii*** can originate either from the Sydney area or from New Zealand, as those are the two only localities visited by Von Hügel, where the species occurs. The type material, probably a holotype, is in NMW.



(from Kensler, 1967)

Fig. 199

Type locality of ***Palinurus tumidus*** (and ***P. giganteus***): "Whaingaroa, a small harbour on the West Coast of the North Island", New Zealand (Kirk, 1880:313), collected in 1877 by J. Buchanan. Holotype male, dry in DMW, no. 5700.

Geographical Distribution : New Zealand (all around North Island, but most common on the north coast; rare in South Island waters, with a few records from the west, north and north east coast and one from the south point), Kermadec Islands (rare, Chilton (1911:549) reported on 2 specimens from Sunday (= Raoul) and Denham Islands, but no records have been published from the Archipelago since), Chatham Islands (Michael & Booth, 1985:18). Australia (from southern Queensland to Victoria; a few records from Tasmania) (Fig. 200).

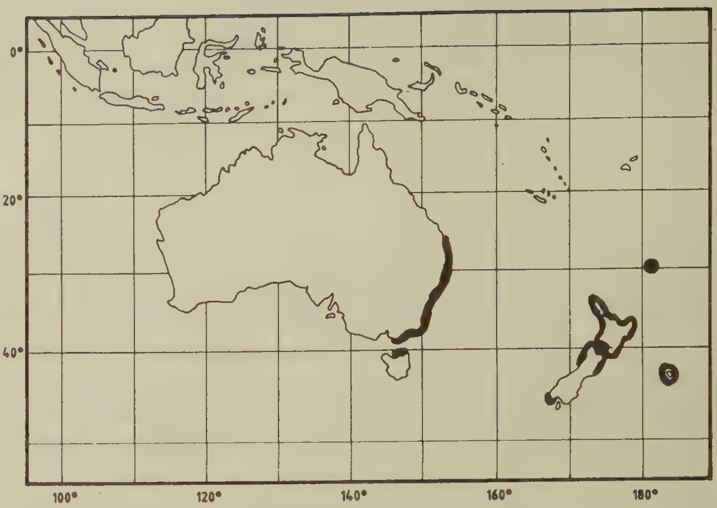


Fig. 200

Habitat and Biology : The species usually occurs in depths between 0 and 155 m, but very few data on depth are published. Booth (1986:2212) indicated that specimens with a tail length of less than 21.6 cm occur at depths between 20 and 130 m, and that the main fishery takes place between 50 and150 m. The substrate is said to be usually sand, gravel, or rocks. Smaller specimens seem to be more frequent on a rocky bottom. Females are ovigerous from late September to January.

Size : The maximum total body length is 60 cm (carapace length about 25 cm). Ovigerous females with a total body length of 38 to 56 cm have been reported (carapace lengths 16 to 24 cm). This species, probably together with ***Homarus americanus***, is the largest known decapod as far as body length is concerned (see Kaestner, 1970:274).

Interest to Fisheries : The species is fished in the northern part of its range both in New Zealand and Australia. Eighty percent of the New Zealand catches are taken on the north coast of North Island between Cape Maria van Diemen and North Cape; the rest of the catches come mainly from the north coast between North Cape and Cape Runaway (Kensler, 1967:419). Booth (1986:2213) reported that "the species is caught most commonly along the north and east coasts of North Island north of Cape Turnagain [= 40°29'S]. In Australia, the fishery for this species also is concentrated in the northern part of its range, namely north and south of Sydney (Port Stephens, 32°42'S, to Bateman's Bay, 35°45'S). Ogilby (1893:201) remarked that "so abundant is this Crayfish, and with proper legislative precautions, so apparently inexhaustible the supply, that at but little expense a great and profitable canning industry might with ease be established". Gruvel (1911:16) described the fishery for this species near Sydney, carried out with motor boats with a crew of 2 to 4 men, putting out lobster pots and trammel nets among the rocks in coastal waters. Dakin, Bennett & Pope (1969:183) mention that in New South Wales the species is mostly taken with lobster pots, but that it also "constantly falls a prey to the wiles of the spear-gun fisherman", while "we have seen an expert catch over a dozen with his hands in an hour or two while wading amongst the weed along the edge of a rock platform at low water". The same authors also mention that the animals are preferably shipped alive to the markets, since by freezing and cooking much of the taste is lost. Kensler & Skrzynski (1970:46-54) observed that in New Zealand lobster pots are used most, but that lobsters are also obtained by trawling and with Danish seines. As to protective measures, in New Zealand the size limit is 21.6 cm tail length,or carapace length 16.3 cm (males) and 15.5. cm (females), while also the catch of ovigerous females is prohibited.

As far as the commercial importance of ***Jasus verreauxi*** in New Zealand is concerned, this is dwarfed when compared to that of ***J. edwardsii***; its annual catch being less than 1% of that of ***J. edwardsii*** (see Kensler & Skrzynski, 1970:46). Between 1962 and 1966 these annual catches of ***J. verreauxi*** in New Zealand varied between 23 and 66 tons, with an average of 36 tons. The FAO Yearbook of Fishery Statistics gives the following landings (in metric tons) for New Zealand: 10 tons in 1987 and 6 tons in 1988. The annual landings (in tons) for the species in Australia are much higher; in Fishing Area 81 (= New South Wales) they totalled 200 in 1987 and in 1988, and in the area 57 (= Victoria, Tasmania, South Australia and Western Australia) 5 000 tons in both these years. Since ***J. verreauxi*** is absent or scarce in fishing area 57 and as ***J. novaehollandiae*** is not represented in the FAO statistics, it seems most likely that these Australian figures correspond to ***J. verreauxi*** and ***J. novaehollandiae*** combined, and thus give a wrong impression.

Local Names : AUSTRALIA: Eastern rock lobster (official Australian name), Australian crayfish, Common crayfish, Common Sydney crayfish, Eastern crayfish, Green cray, Green crayfish, Marine crayfish, New South Wales spiny lobster, Sea crayfish, Sydney crayfish; NEW ZEALAND: Packhorse crayfish, Green crayfish, Green lobster, Packhorse lobster, Smooth-tailed crayfish; Pawharu (Maori).

Literature : Kensler, 1967:207-10, pl. 1.

Remarks : The name ***Palinurus giganteus*** was only qualifiedly given by Kirk, 1880:313 ("although perhaps, ***giganteus***, would be quite as appropriate"). It falls as an objective synonym of ***Palinurus tumidus*** Kirk.

Justitia Holthuis, 1946

Justitia Holthuis, 1946, Temminckia, 7:113, 115. Gender feminine.

Type Species: by original designation: ***Palinurus longimanus*** H. Milne Edwards, 1837.

Synonyms : ***Nupalirus*** Kubo, 1955, Journal Tokyo University Fisheries, 41(2):185. Type species, by original designation and monotypy: ***Nupalirus japonicus*** Kubo, 1955. Gender masculine.

The genus includes three species, none of which so far is of commercial importance; the possibility that they will ever be of interest to fisheries is very slim.

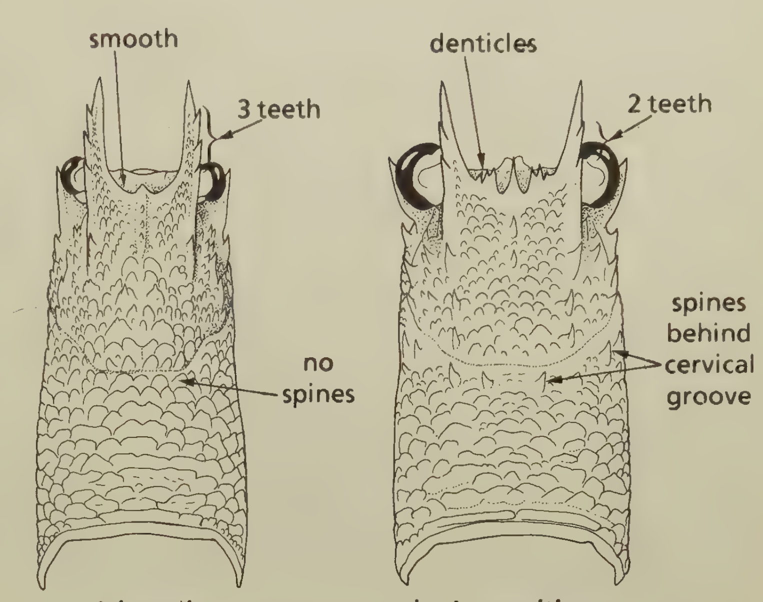
Key to Species:

1a. Frontal horns with three dorsal teeth Anterior margin of carapace between the small, spiniform rostrum and the frontal horns without teeth. Carapace without spines behind the cervical groove (Fig. 201a); 6 or 7 transverse grooves on the second to fifth abdominal somites, all reaching to the base of the pleura (Fig. 202a). Indo-West Pacific .... ***J. japonica*** (Fig. 203)

1b. Frontal horns with two dorsal teeth. Anterior margin of carapace with several sharply pointed small teeth between the small spiniform rostrum and the frontal horns. Carapace behind cervical groove with spines (Fig. 201b); 4 or 5 transverse grooves on the second to fifth abdominal somites, not all reaching to the base of the pleura, and some interrupted dorsally (Fig. 202b)

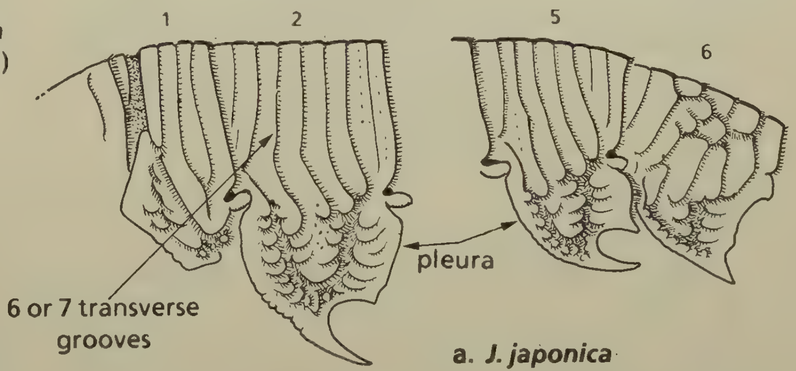
  2a. Atlantic species .... ***J. longimanus*** (Fig. 205)

  2b. Indo-West Pacific species ...... ***J. mauritiana*** (Fig. 207)

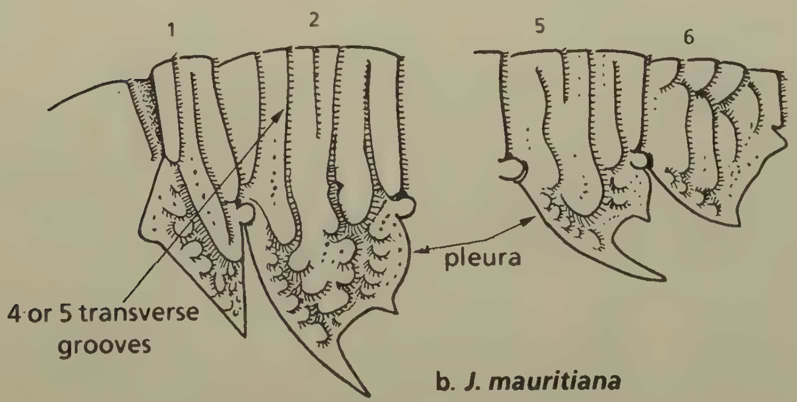


a. ***J. japonica*** **b.** ***J. mauritiana***

carapace (dorsal view) (from Crosnier, 1977) Fig. 201



a. ***J. japonica***



b. ***J. mauritiana***

1st and 2nd, and 5th and 6th abdominal somites in lateral view (from Gordon, 1960) Fig. 202

Justitia japonica (Kubo, 1955)

Fig. 203

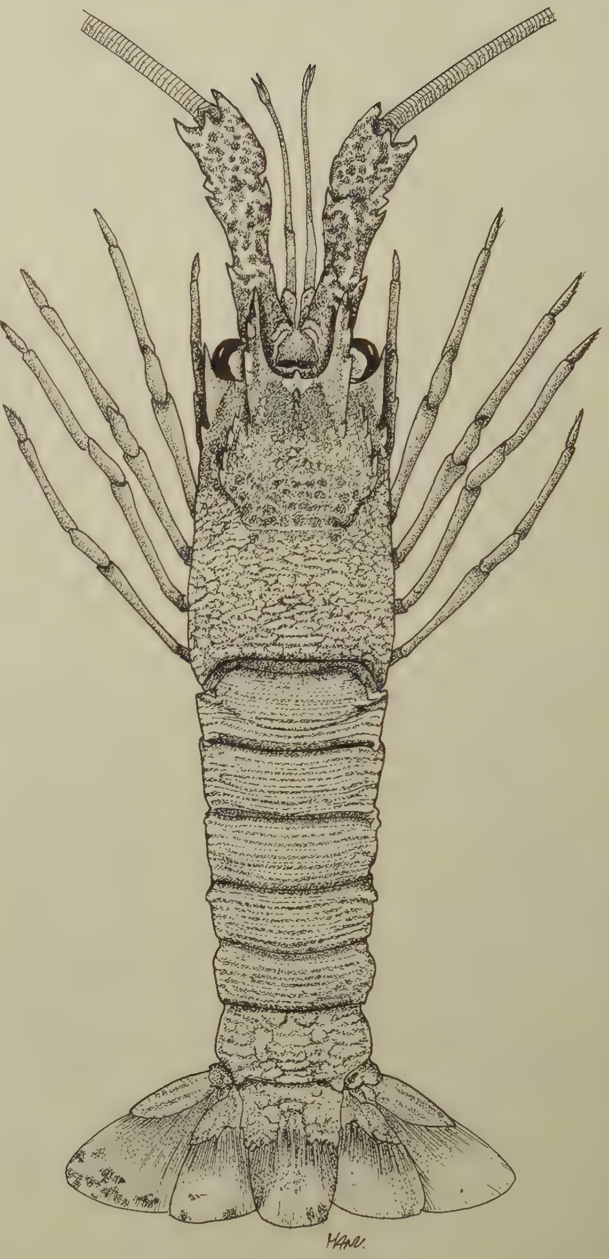
PALIN Just 3

Nupalirus japonicus Kubo, 1955, Journal Tokyo University Fisheries, 41(2):185, pls.12,13.

FAO Names : **En** - Japanese furrow lobster.

Type : Type locality: "about 8 miles off Shimokawaguchi (Shimizu city), Kôchi Pref., Japan". Holotype male "in the biological museum of Kôchi Prefecture Women's University"

Geographical Distribution : Indo-West Pacific region: Madagascar (N.W. coast near Majunga, and S.E. coast near Fort Dauphin), Mauritius, Réunion, Japan (off Pacific coast of central and southern Japan from Kii Peninsula to the south coast of Shikoku Island; Bonin Islands) (Fig. 204).



(after Baba et al., 1986)

Fig. 203

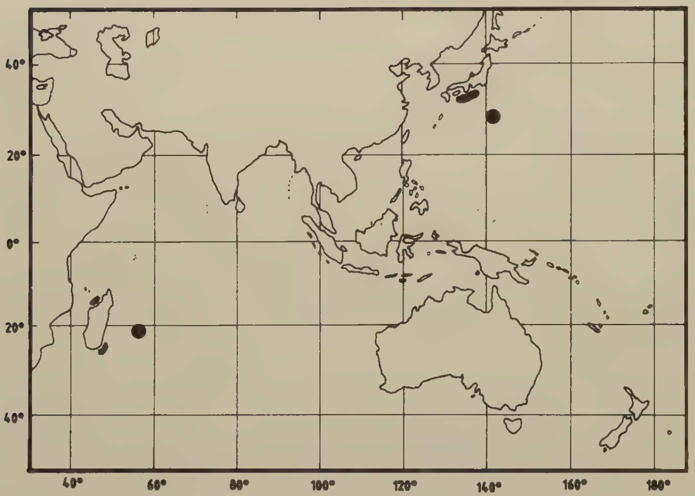


Fig. 204

Habitat and Biology : Depth range from 40 to 200 m. According to Crosnier & Jouannic (1973:13) the species seems to prefer rocky substrates.

Size : Maximum total body length 24 cm; usually not more than 20 cm. Carapace length 6 to 9 cm.

Interest to Fisheries : At present none. Specimens are occasionally taken in lobster pots and trap nets; the habitat evidently is inaccessible to trawls. Sekiguchi & Okubo (1986:21) reported an annual catch of 4 to 41 specimens (between October and April) of this species in Mie Prefecture, Japan. Many of the specimens were placed in the several public aquaria in Japan.

Local Names : JAPAN: Ryoma ebi

Literature : Gordon, 1960, pp. 296-305, figs 1-6; Baba et al., 1986, pp. 154, 155, 282, fig. 105.

Justitia longimanus (H. Milne Edwards, 1837)

Fig. 205

PALIN Just 1

Palinurus longimanus H. Milne Edwards, 1837, Histoire naturelle des Crustacés, 2:295.

Synonyms: Sometimes when used with the generic name ***Justitia***, the specific name is incorrectly spelled ***longimana***, probably because ***Justitia*** is a feminine name. However, as ***longimanus*** is a noun, its ending is not to be changed with the gender of the generic name (International Code, Art. 31(b)ii).

FAO Names : **En** - West Indian furrow lobster; **Fr** - Langouste caraïbe; **Sp** - Langosta de muelas.

Type : Type locality: "Habite les Antilles". Type material in MP, no. Pa 421, dry in rather good condition. This type specimen, if not the holotype, is here selected the lectotype. Not located in 1989.

Geographical Distribution : Western Atlantic region: Bermuda, S. Florida (USA), Caribbean arc from Cuba to Isla Margarita (Venezuela), Curaçao, and E. Brazil (Espiritu Santo State) (Fig. 206).

Habitat and Biology : Depth range from 1 to 300 m, usually between 50 and 100 m. Inhabits the outer parts of coral reef slopes.

Size : Maximum total body length about 15 cm, usually up to 10 cm.

Interest to Fisheries : Very slight. The species is not the object of a special fishery, but is sometimes caught incidentally in lobster pots at greater depths. Morice (1958:86) lists the species among the edible Crustacea of Martinique, and states that it is consumed locally by the fishermen, but appears hardly, if ever, on the markets.

Local Names : CUBA: Camarón de lo alto; CURACAO: Kreef di laman hundu (= deep sea lobster), Kreef di awa blau (= blue water lobster) (Papiamento language); GUADELOUPE: Criquet (St. Barthelémy); MARTINIQUE: Homard brésilien; USA: Long-armed lobster, Long-armed spiny lobster.

Literature : Fischer (ed.), 1978:vol. 6.

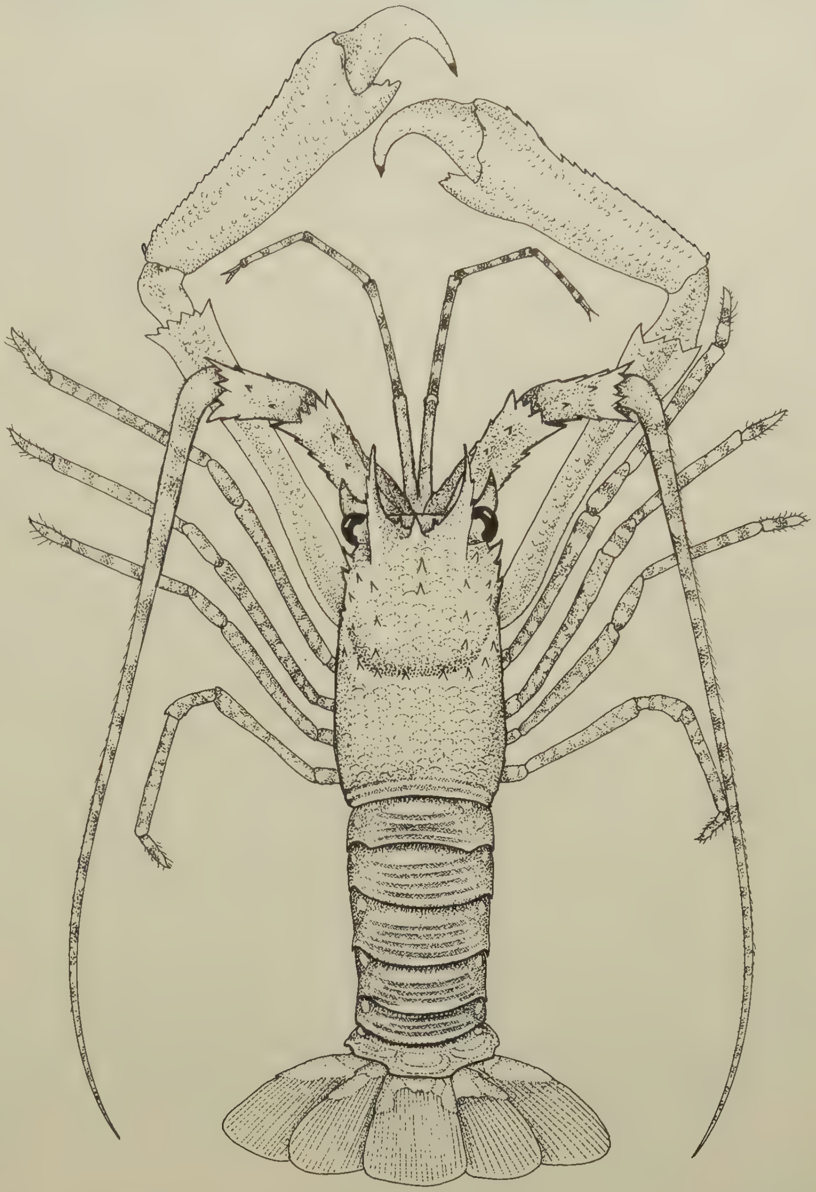


Fig. 205

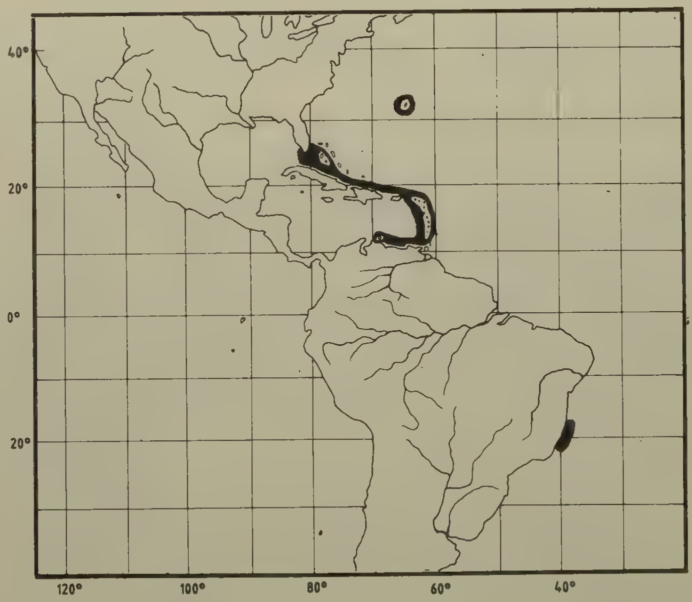


Fig. 206

Justitia mauritiana (Miers, 1882)

Fig. 207

PALIN Just 2

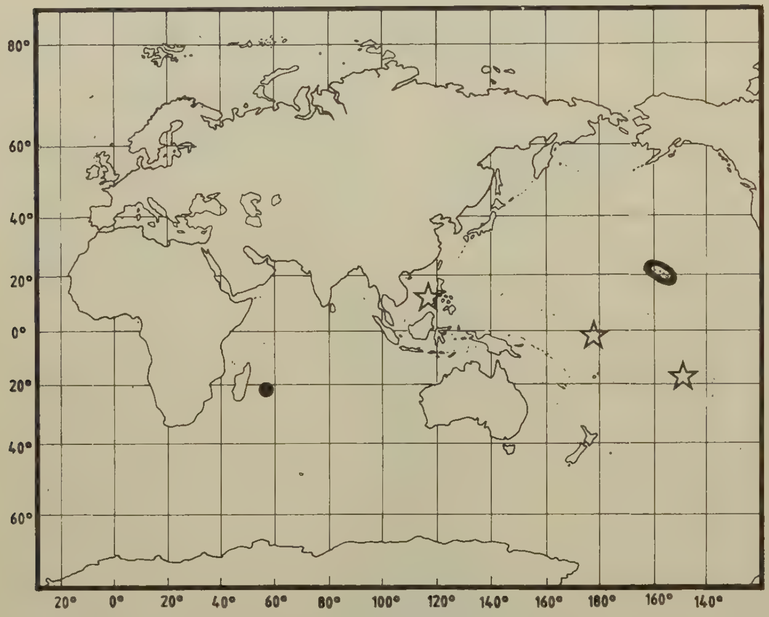
Palinurus longimanus mauritianus Miers, 1882, Proceedings Zoological Society, London, 1882:540, pl. 36 fig. 1.

Synonyms: ***Justitia longimana mauritania*** - Holthuis, 1946.

FAO Names : En - Gibbon furrow lobster; **Fr** - Langouste gibbon.

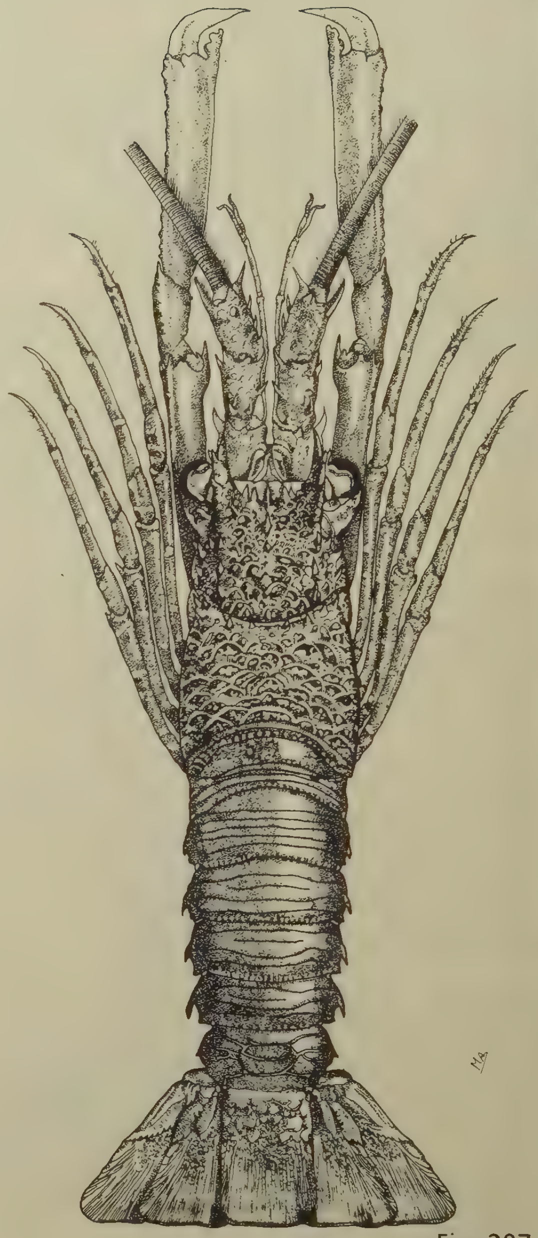
Type : Type locality: Mauritius, "in a fishing-net at a depth of 40 fathoms" (= 73 m). Holotype male, in BM, no 81.12 (dry, condition fair).

Geographical Distribution : Indo-West Pacific region: Western Indian Ocean (Mauritius, Réunion), Hawaiian Archipelago. Larvae supposed to be of this species have been reported from the Philippines, the Gilbert Islands and Tahiti (Fig. 208).



☆ larval records (supposedly of this species)

Fig. 208



(after Miers, 1882)

Fig. 207

Habitat and Biology : Depth range from 30 to 200 m. The species seems to prefer rocky or coral substrates.

Size : Maximum total body length 16 cm, carapace length 6 cm; average carapace length 4 to 5 cm.

Interest to Fisheries : The species is not actively fished for. Experimental fishing with lobster pots and trammel nets near Réunion resulted in small catches. Its small size, apparent scarcity and habitat (rough bottom and relatively great depth) make it an unlikely subject for a fishery.

Local Names : USA: Long-handed spiny lobster, Ula (Hawaii).

Literature : Fischer & Bianchi (eds), 1984:vol 5.

Linuparus White, 1847

Linuparus White, 1847, List of the specimens of Crustacea in the collection of the British Museum: 70. Gender masculine. Name placed on the Official List of Generic Names in Zoology in Opinion 519 (published in 1958).

Type Species: by monotypy: ***Palinurus trigonus*** Von Siebold, 1824.

Synonyms : ***Podocratus*** Geinitz, 1849, Das Quadersandsteingebirge oder Kreidegebirge in Deutschland:96. Type species, by monotypy: ***Podocratus duelmense*** Geinitz, 1849; gender masculine.

Thenops Bell, 1858, A monograph of the fossil malacostracous Crustacea of Great Britain, (1):33; type species, by monotypy: ***Thenops scyllariformis*** Bell, 1858; gender masculine.

Avus Ortmann, 1891, Zoologische Jahrbücher, Systematik, 6:15, 21; type species, by monotypy: ***Palinurus trigonus*** Von Siebold, 1824; gender masculine.

Eolinuparus Mertin, 1941, Nova Acta Leopoldina, (n.ser.) 10(68):215; type species, by original designation: ***Thenops carteri*** Reed, 1911; gender masculine.

Apart from a great number of fossil species, the genus ***Linuparus*** has three recent species, all are dealt with here.

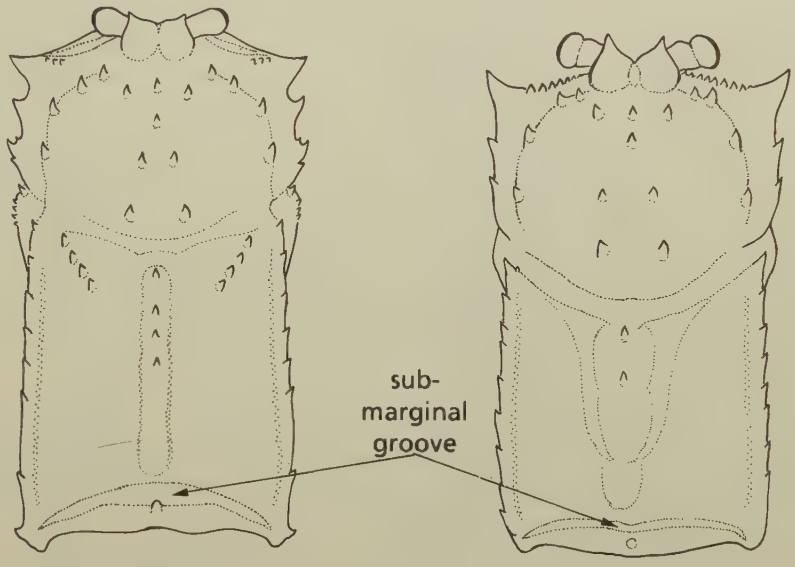
Key to Recent Species (after Berry & George, 1972:18).

1a. Submarginal posterior groove of carapace much wider medially than laterally (Fig. 209a). Vestigial pleopods present on first abdominal segment of female .... ***L. somniosus*** (Fig. 211)

1b. Submarginal posterior groove of carapace as wide medially as laterally (Fig. 209b). No pleopods on first abdominal segment of female

    2a. Epistomal ridges coarsely granulated, without an acute well developed anterior tooth (Fig. 210a). Chitinous margin of male genital aperture with toothed median border and entire lateral border .... ***L. sordidus*** (Fig. 213)

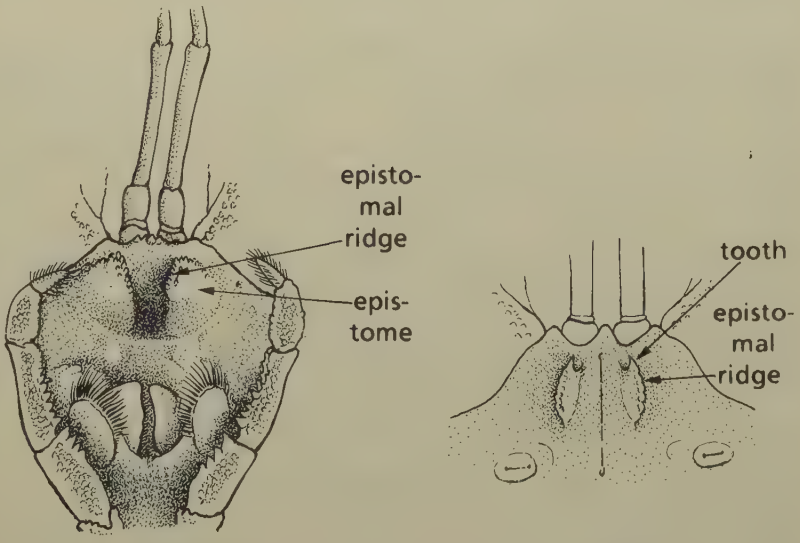
    2b. Epistomal ridges feebly granulated, with an acute well developed anterior tooth (Fig. 210b). Chitinous margin of male genital aperture toothed throughout its length .... ***L. trigonus*** (Fig. 215)



a. ***L. somniosus*** b. ***L. sordidus***

carapace (dorsal view)

Fig. 209



a. ***L. sordidus*** b. ***L. trigonus***

anterior part of the body (ventral view) epistome

Fig. 210

Linuparus somniosus Berry & George, 1972

Fig. 211

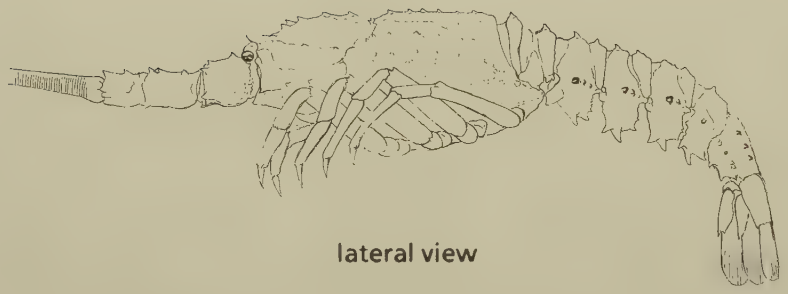
PALIN Lin 1

Linuparus somniosus Berry & George, 1972, Zoologische Mededelingen, Leiden, 46:18, text-fig.1, pls 1,2.

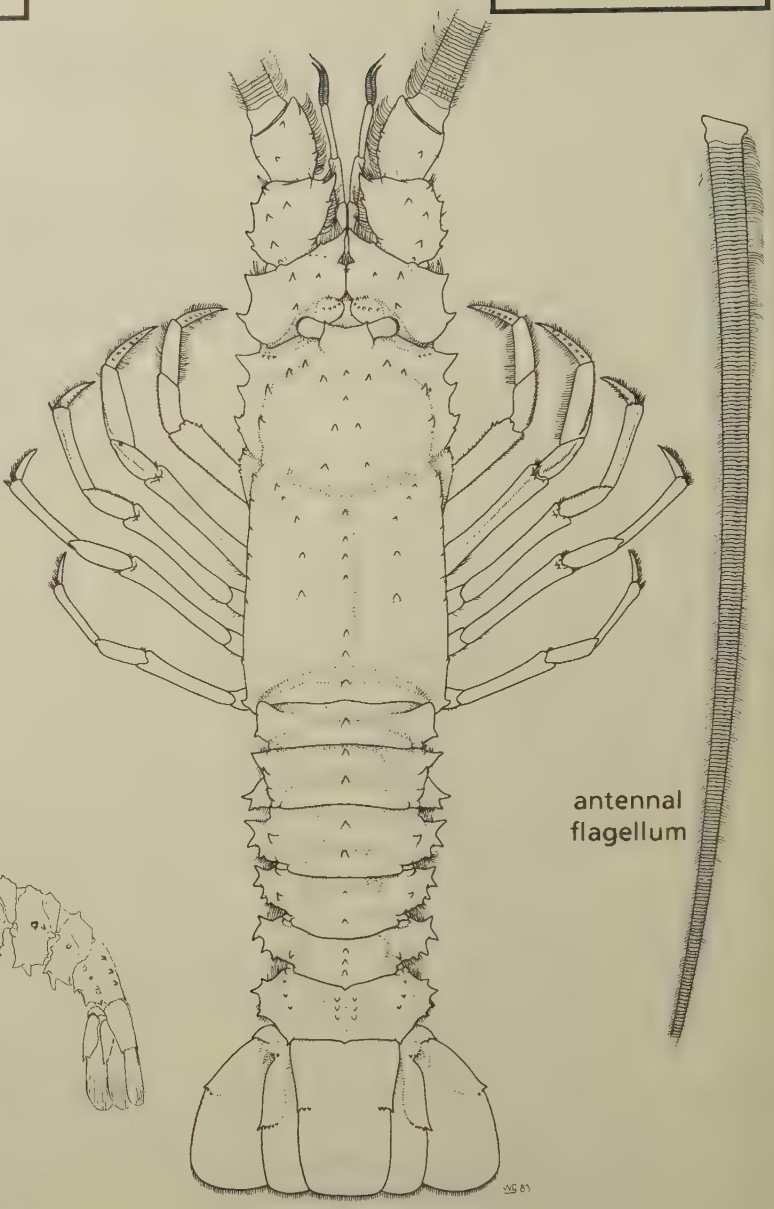
Synonyms: In older literature the species was sometimes incorrectly identified as ***L. trigonus***.

FAO Names : En - African spear lobster; **Fr** - Langouste javelot d'Afrique; **Sp** - Langosta jabalina africana.

Type : Type locality: "N.E. of Bazaruto Island", Natal, South Africa, 234 m depth. Holotype female in BM, no. 1971:120; 2 paratypes BM, no. 1971:121; 2 paratypes RMNH, nos D 27137 and D 27138 (all types in alcohol, condition good).



lateral view



dorsal view

Fig. 211

Geographical Distribution : Off the east coast of Africa from Kenya to Natal, South Africa (Fig. 212).

Habitat and Biology : Depth range from 216 to 375; on rough substrate with sand and mud.

Size : Maximum total body length about 35 cm, carapace length 14 cm; average carapace length about 10 cm.

Interest to Fisheries : At present very minor. The species is not fished commercially in most of its range, but according to Ivanov & Krylov (1980:286) it supports a commercial fishery in Tanzanian waters, where, off Zanzibar, catches of over 10 kg/h were taken by bottom trawls. The animals are mostly marketed fresh.

Local Names : MOZAMBIQUE: Lagosta lanceira.

Literature : Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986:14, fig. 30.

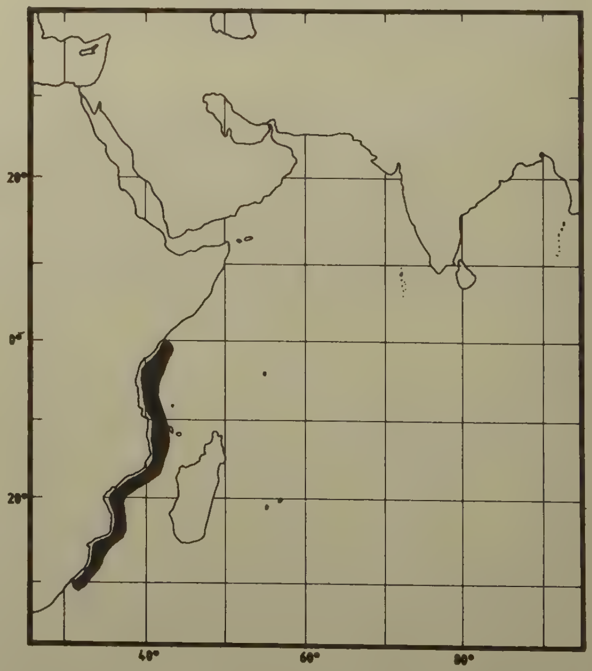


Fig. 212

Linuparus sordidus Bruce, 1965

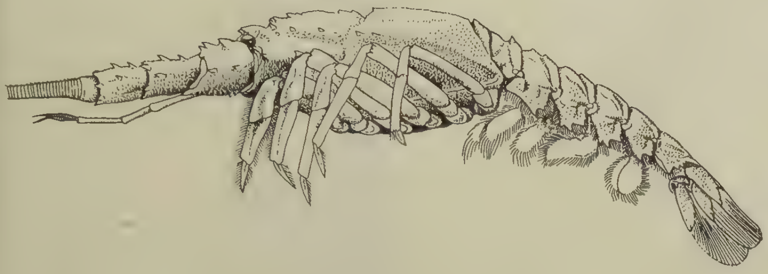
Fig. 213

PALIN Lin 2

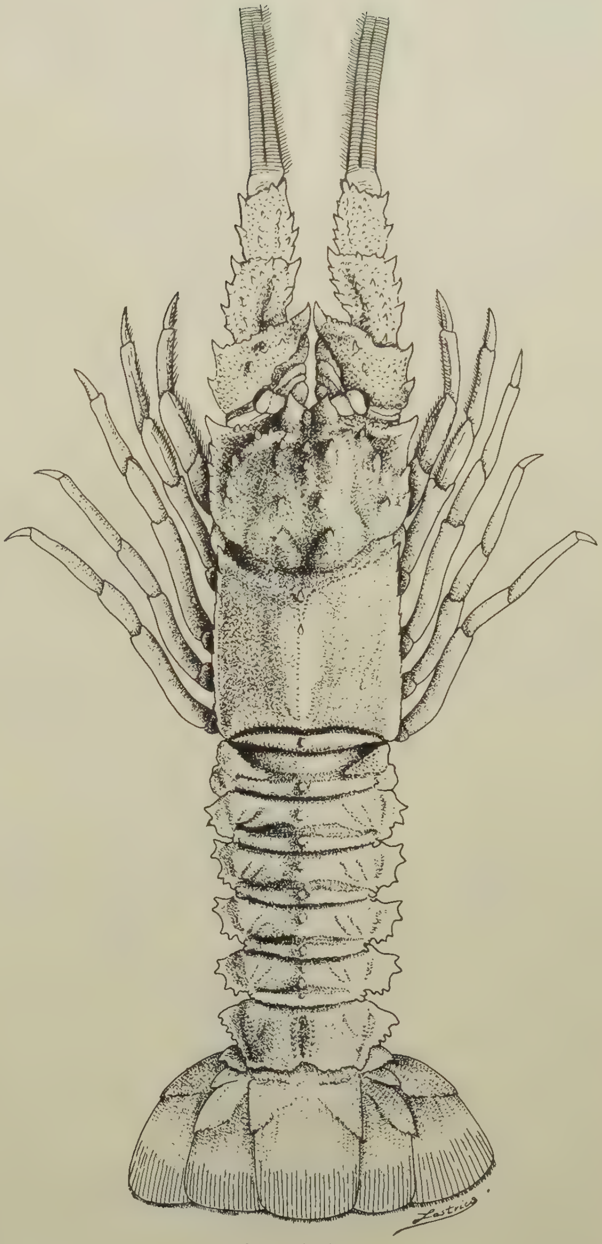
Linuparus sordidus Bruce, 1965, Zoologische Mededelingen, Leiden, 41(1):1, text-fig.1, pls. 1,2.

FAO Names : **En** - Oriental spear lobster.

Type : Type locality: "South China Sea, 19° 40.0'N 113° 41.0'E to 19°39.5'N 113°36.0'E, 182-172 fathoms [= 315-333 m], coarse sand". Holotype female in BM, no. 1965.5.21.1 (in alcohol, condition fair); paratype in RMNH, no D 21213 (in alcohol, condition good).



lateral view



dorsal view

Fig. 213

Geographical Distribution : Indo-West Pacific region: Taiwan, South China Sea and N.W. Australia (off Port Hedland, Western Australia) (Fig. 214).

Habitat and Biology : Depth range from 200 to 333 m; bottom mud and limestone rocks.

Size : The total body length (including the antennae) of the holotype is 38 cm, carapace length 7 cm.

Interest to Fisheries : None at present. However, the size of the specimens and the fact that they occur in not very deep water, suggest that, once the right fishing grounds have been found, the species may be commercially exploited, like ***L. trigonus***.

Local Names : AUSTRALIA: Spear lobster.

Literature : Original description; George, 1983:16-20; Williams, 1986:15, fig. 32.

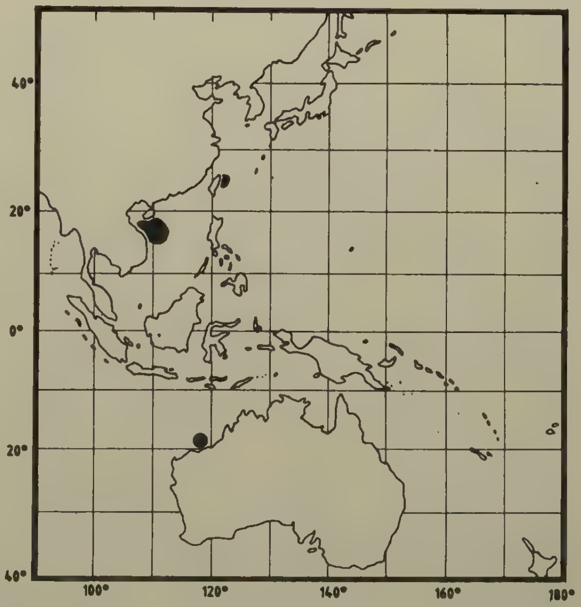


Fig. 214

Linuparus trigonus (Von Siebold, 1824)

Fig. 215

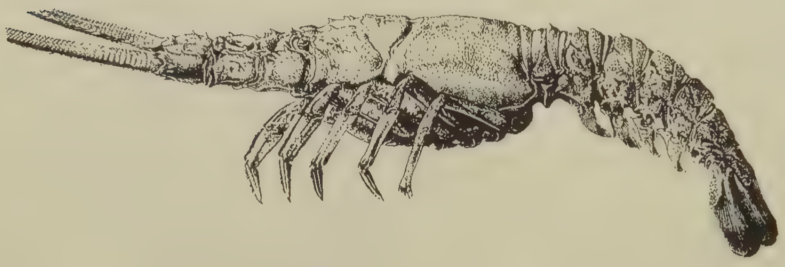
PALIN Lin 3

Palinurus trigonus Von Siebold, 1824, De Historia Naturalis in Japonia statu: 15. Name placed on the Official List of Specific names in Zoology, in Opinion 519 (published in 1958).

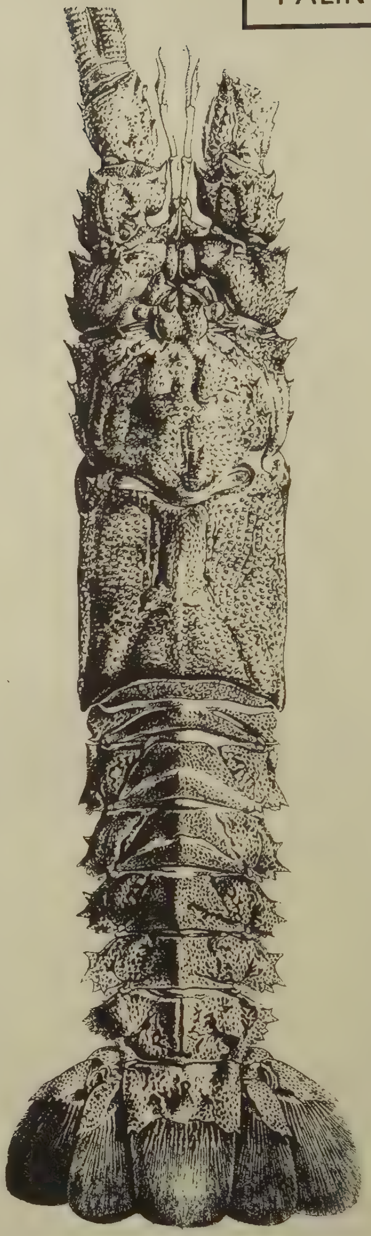
Synonyms: ***Avus trigonus*** - Ortmann, 1891

FAO Names : En - Japanese spear lobster.

Type : Type locality: Japan, possibly neighbourhood of Nagasaki; restricted to Omura Bay near Nagasaki, Kyushu, Japan, by Holthuis (1966:265-266). Lectotype in RMNH, no. D 5611 (dry, condition good, paralectotypes in RMNH, BM, USNM).



lateral view



(from De Haan, 1841)

dorsal view

Fig. 215

Geographical Distribution: Indo-West Pacific region: Japan, Korea, China, Taiwan, Philippines, eastern and western Australia (Fig. 216).

Habitat and Biology : The species has been reported from depths between 30 and 318 m. The substrate on which it is caught is described as sand or mud, sometimes with shells; some older records indicate rocky environments.

Size : Maximum total length 47 cm; carapace length 8 to 18 cm.

Interest to Fisheries : Already H. Burger around 1830, said that the species is scarce in Japan, but when caught, is used as food (Holthuis, 1966:266). Also in Korea and China the species is sold on the markets as food, but is nowhere plentiful. Chang (1964:11) remarked that it is very scarce in Taiwan and on the markets it is priced cheaper than the other spiny lobsters because of its coarse flesh and thick shell. Motoh & Kuronuma (1980:56) reported that in the Philippines the species " is rarely offered for sale in the market", and that it is caught there by commercial trawlers. George (1983:17) remarked that in Western Australia, off Port Hedland, ***Linuparus trigonus*** was trawled with deepwater Engel trawls in 200 m of water "in sufficient quantities to provide occasional excellent meals for the crew and that in Japan this same species is the basis for a small commercial enterprise". Off Townsville, Queensland, Australia, the species "occurs in densities high enough to support an occasional fishery. The fishery is confined to a small, well-defined area of the continental slope, about 70 km by 20 km, in depths of 200 to 250 m. Here ***L. trigonus*** is taken mainly by prawn trawlers during their off-season" (T.J. Ward, in press).

Local Names : AUSTRALIA: Spear lobster, Champagne lobster, Barking crayfish; JAPAN: Hako-ebi (= box lobster), Ishi-ebi (= stone lobster); PHILIPPINES: Uson (Ilongo).

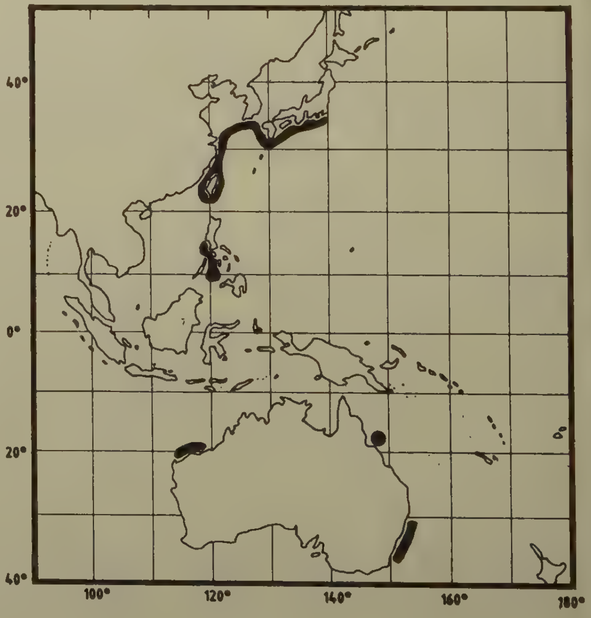


Fig. 216

Literature : De Haan, 1841:157-158, pls.39,40; Williams, 1986 :15, figs 31,78 f-g.

Palinurus Weber, 1795

PALIN Palin

Pallinurus Weber, 1795, Nomenclator entomologicus:94. Gender masculine. Name emended under the plenary power of the International Commission on Zoological Nomenclature to ***Palinurus***, and placed on the Official List of Generic Names in Zoology, in Opinion 519 (published in 1958).

Type Species: by monotypy: ***Astacus elephas*** Fabricius, 1787.

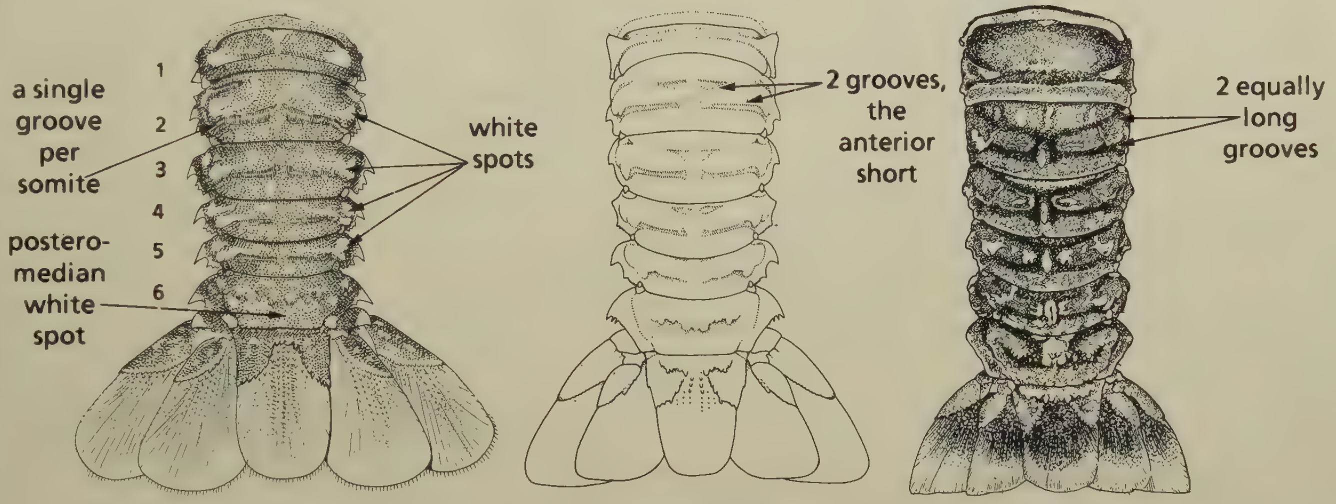
This is the oldest known among the Palinurid genera, and has a restricted distribution: it is found only in the Eastern Atlantic, Mediterranean, and off south east Africa. Five species are known, all of present or potential commercial interest.

Key to Species :

1a North-eastern Atlantic, from S. Norway to the Cape Verde Islands. Abdominal somites with a single distinct transverse groove (Fig. 217a)

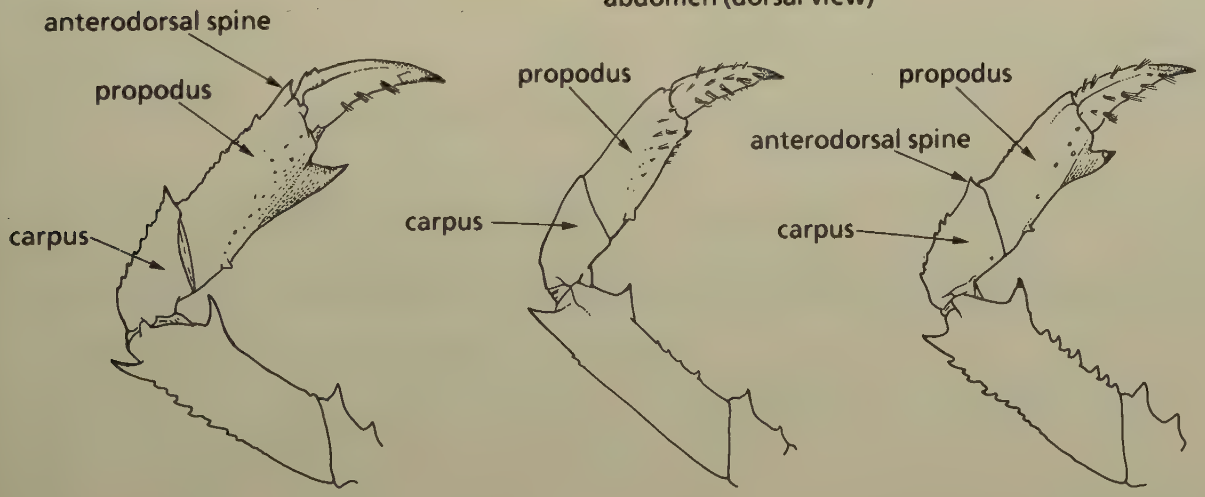
2a. Propodus of first pereiopod of male with an anterodorsal spine (Fig. 218a). Colour dark brown or purple; abdominal somites 2 to 5 each with a distinct pair of large white spots, somite 6 with a single posteromedian white spot (Fig. 217a). Legs longitudinally streaked with brown and yellowish. Depth 0 to 70 m ... ***P. elephas*** (Fig. 224)

2b. Propodus of first pereiopod of male without anterodorsal spine (Fig. 218b). Colour a pink or reddish marbled with white; abdominal somites irregularly marbled. Legs ringed with whitish and pink. Depth 40 to 600 m or more


a single groove per somite
1
2
3
4
5
6
postero-median white spot
white spots
2 grooves, the anterior short
2 equally long grooves

a. ***P. elephas*** b. ***P. delagoae*** c. ***P. gilchristi*** Fig. 217

abdomen (dorsal view)


anterodorsal spine
propodus
carpus
propodus
carpus
propodus
anterodorsal spine
carpus

a. ***P. elephas*** b. ***P. mauritanicus*** c. ***P. charlestoni*** Fig. 218

first pereiopod of male

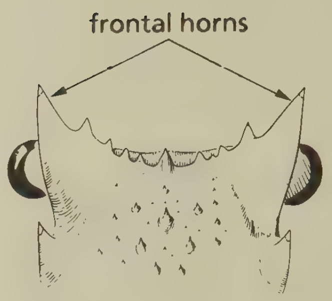
3a. Frontal horns flat, their inner margins forming with the anterior margin of the carapace a shallowly concave arc (Fig. 219a). Carapace in adult males strongly swollen. Carpus of first leg without anterodorsal spine (Fig. 218b). Eastern Atlantic from W. of Ireland to S. Senegal, including the western Mediterranean, depth from 40 to 600 m .... ***P. mauritanicus***
(Fig. 228)

3b. Frontal horns with the inner margins and the anterior margin of the carapace forming a V-shaped line (Fig. 219b). Carapace in adult male not swollen. Carpus of first male leg with an anterodorsal spine (Fig. 218c). Cape Verde Islands, 50 to 300 m .... ***P. charlestoni***
(Fig. 220)

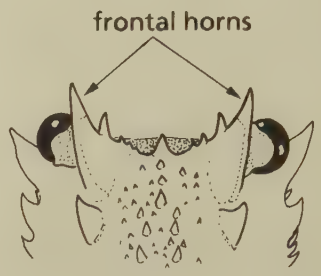
1b. South and Southeast Africa (False Bay, South Africa, to Mozambique, S.E. Madagascar). Abdominal somites 2 to 5 with two transverse grooves (Fig. 217 b, c)

4a. Anterior groove of abdominal somites 2 to 5 shorter and less distinct than the posterior groove (Fig. 217b). Carapace before cervical groove naked. Merus of walking legs cylindrical and naked .... ***P. delagoae***
(Fig. 222)

4b. Anterior groove of abdominal somites 2 to 5 very deep and as hairy as the posterior groove (Fig. 217c). Carapace in front of the cervical groove pubescent. Merus of walking legs triangular in transverse section, the flat outer surface pubescent .... ***P. gilchristi***
(Fig. 226)



a. ***P. mauritanicus***



b. ***P. charlestoni***

anterior part of carapace
(dorsal view) Fig. 219

Palinurus charlestoni Forest & Postel, 1964

Fig. 220

PALIN Palin 2

Palinurus charlestoni Forest & Postel, 1964, Bulletin Muséum National d'Histoire Naturelle, Paris, (2)36:100, 102, figs 2, 5, 7.

FAO Names : En - Cape Verde spiny lobster; **Fr** - Langouste de Cap Vert; **Sp** - Langosta de Cabo Verde.

Type : Type locality: "Iles du Cap Vert, groupe nord, de St. Vincent à Sal, entre 180 et 200 m". Holotype male in MP, no. Pa. 331; paratypes in MP, Pa. 84, Pa. 330; RMNH D. 19544. All type material in alcohol, in excellent condition.

Geographical Distribution : So far known only from Cape Verde Islands (Fig. 221).

Habitat and Biology : Depth range from 50 to 300 m, perhaps deeper; on an uneven rocky bottom, sometimes on steep slopes.

Size : Maximum total body length to 50 cm, average length to 40 cm.

Interest to Fisheries : Minor. In 1963 the first attempts were made for a commercial fishery, using lobster pots. In the most productive areas, two lobsters were caught per pot per day. Due to the rough bottom, the loss of pots was rather substantial. Longhurst (1970:277) reported actual landings of 10 to 20 tons.

Literature : Original description. Fischer, Bianchi & Scott (eds), 1981:vol. 5; Williams, 1986:16, fig. 36.

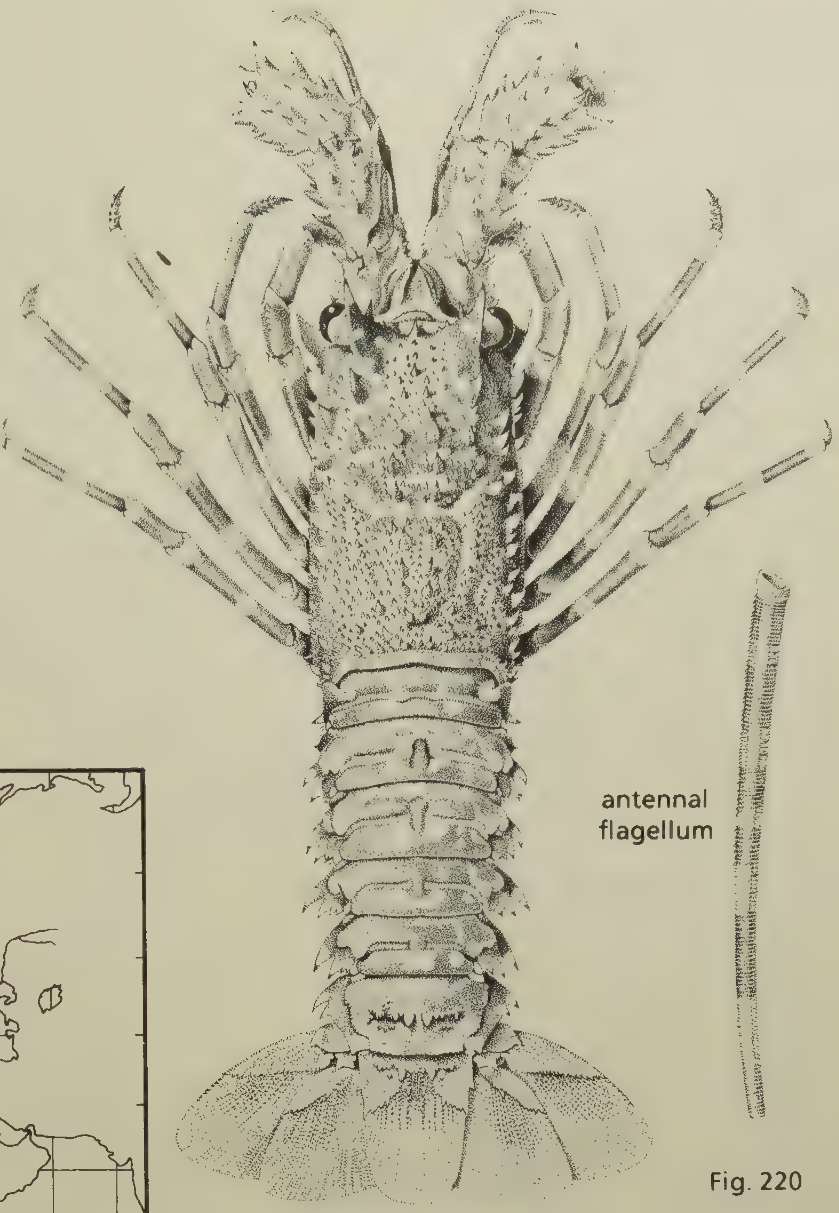


Fig. 220

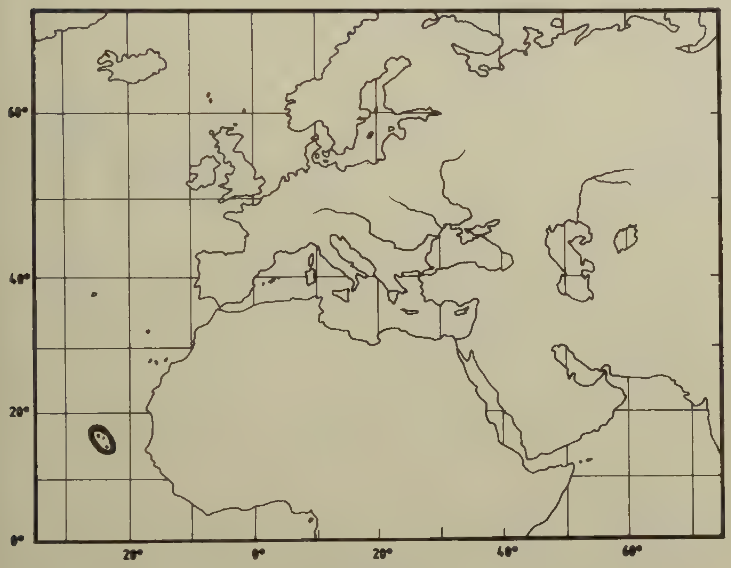


Fig. 221

Palinurus delagoae Barnard, 1926

Fig. 222

PALIN Palin 4

Palinurus gilchristi delagoae Barnard, 1926, Transactions Royal Society South Africa, 13:123, pl. 11.

Synonyms : ***Palinurus gilchristi natalensis*** Barnard, 1926.

FAO Names : En - Natal spiny lobster; **Fr** - Langouste du Natal; **Sp** - Langosta del Natal.

Type : Type locality: of ***P. gilchristi delagoae***: off Delagoa Bay, S. Mozambique, "25°58'S., 33°5'E., 228 metres, sand and shell"; male type evidently lost, a neotype selected by Berry & Plante, 1973:374; the neotype locality is: "off Tongaat, Natal, 324 m", South Africa. Neotype male in SAM, no. A 13179 (in alcohol condition good).

Type locality of ***P. gilchristi natalensis***: "Natal coast, from off Umkomaas River in the south as far north as off Tugela River and off Delagoa Bay, 100-260 fathoms [= 183-480 m]"; syntypes in SAM.

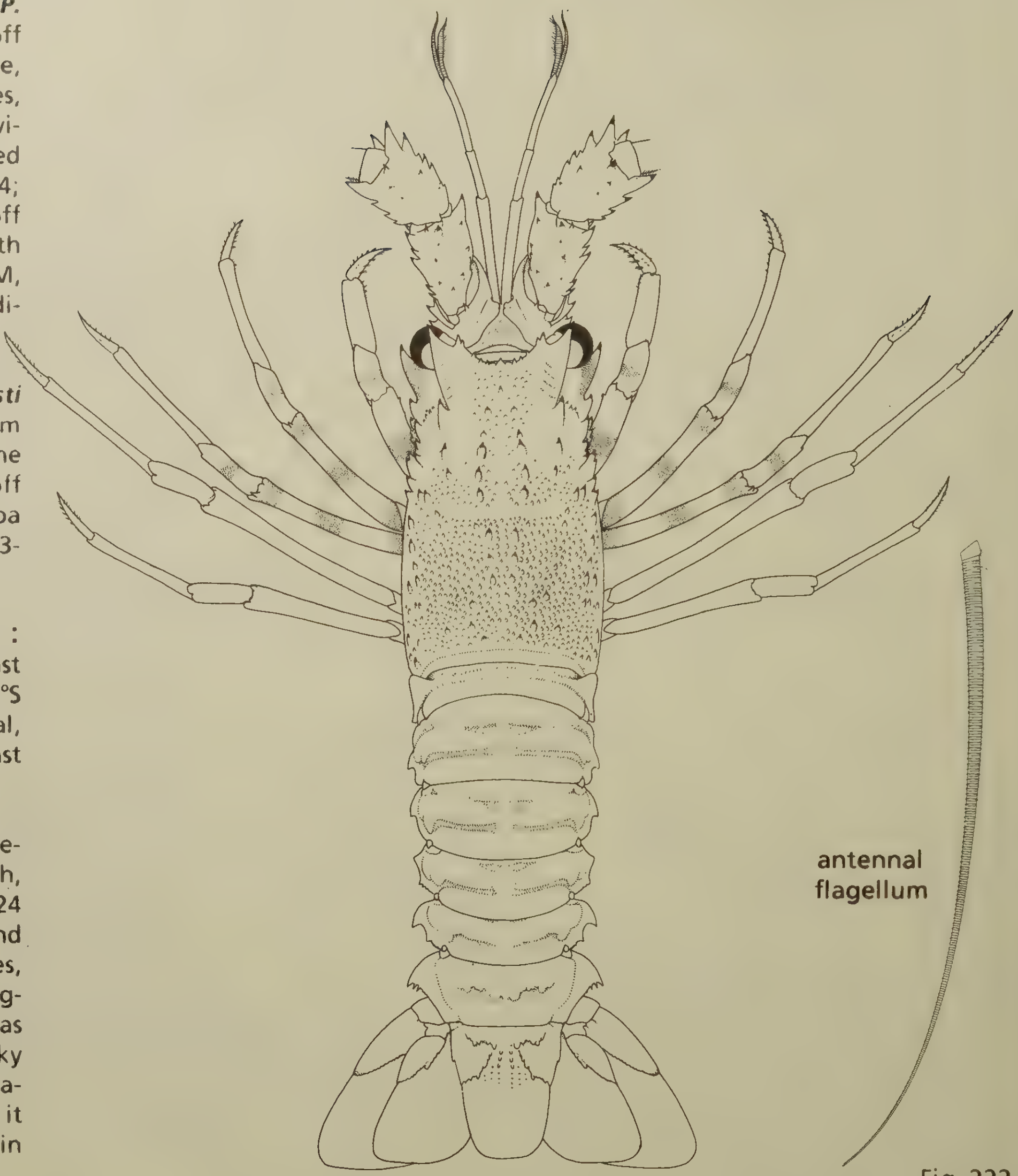


Fig. 222

Geographical Distribution : Indo-West Pacific region: East coast of Africa from 17°S (Mozambique) to 30°S (Natal, South Africa), south east Madagascar (Fig. 223).

Habitat and Biology : Reported from 0 to 400 m depth, usually between 180 and 324 m. Off South Africa it is found on muddy or sandy sub-strates, sometimes with coral fragments; off Madagascar it has been reported from a rocky substrate. The species is gregarious and seems to migrate; it can sometimes be caught in enormous numbers.

Size : Maximum total body length 35 cm, carapace length to 17 cm; average carapace length about 10 cm.

Interest to Fisheries : Off south east Africa the species is taken by trawlers, while off Madagascar, lobster pots were used during experimental fishing. It is marketed frozen. The annual catch was 89 tons in 1987 and 25 tons in 1988 (FAO Yearbook of Fishery Statistics, 1990).

Local Names: MOZAMBIQUE: Lagosta de profundidae.

Literature : Berry & Plante, 1973:374-7, text-fig.1, pl. 19; Fischer & Bianchi (eds), 1984:vol.5; Williams, 1986:15, fig. 33.

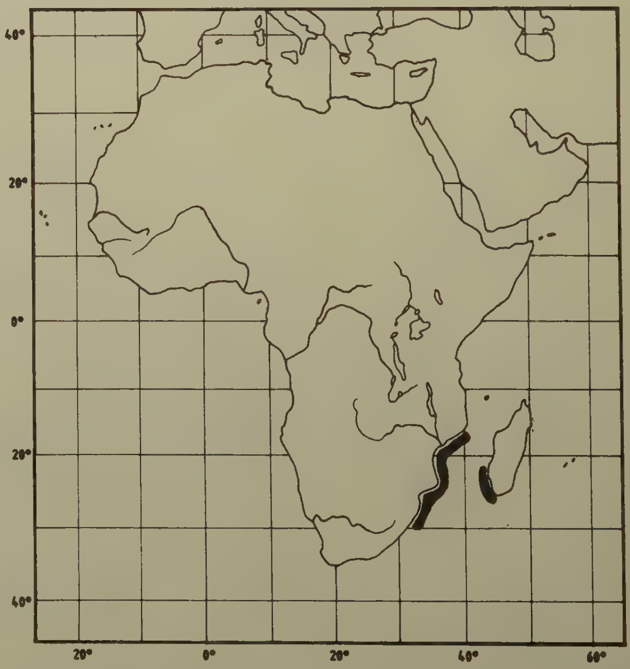


Fig. 223

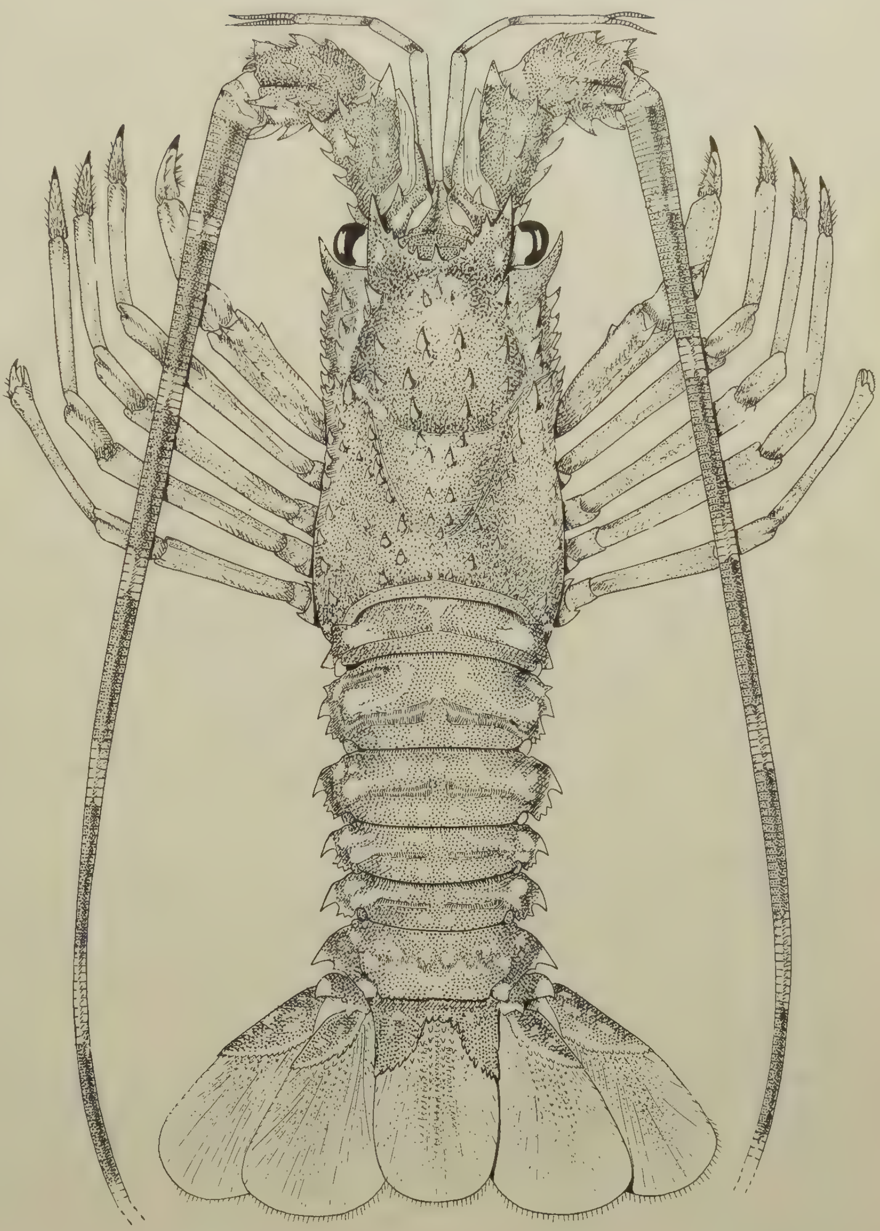
Palinurus elephas (Fabricius, 1787)

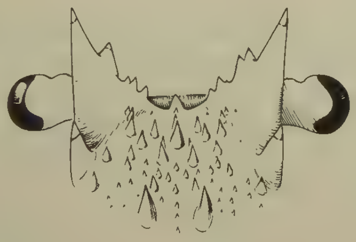
Fig. 224

PALIN Palin 1

Astacus elephas Fabricius, 1787, Mantissa Insectorum, 1:331. Name placed on the Official List of Species Names in Zoology in Opinion 519 (published in 1958).

Synonyms : ***Cancer elephas*** - Gmelin, 1789; ***Cancer locusta*** Wulfen, 1791 (not ***Cancer locusta*** Linnaeus, 1758) (= ***Gammarus locusta*** (L.)); ***Palinurus quadricornis*** Fabricius, 1798; ***Palinurus vulgaris*** Latreille, 1803; ***Palinurus locusta*** - Olivier, 1811; ***Palinurus langusta*** Rafinesque, 1814 (nom.nud.); ***Pagurus maculatus*** Bowdich, 1825 (not ***Pagurus maculatus*** Risso, 1827 (= ***Paguristes eremita*** (L., 1767)); ***Palinurus marinus*** Bate, 1868. "[***Palinurus***] ***adriaticus***, Costa" was cited by Carus (1885:487) under ***Palinurus*** and treated as a good species of that genus. Stephensen (1923:77) treated "***Palinurus adriaticus*** Costa" as a synonym of ***P. elephas*** (which he indicated as ***P. vulgaris***). However, there exists no ***Palinurus adriaticus*** Costa, as Costa never described such a species. He did describe ***Palaemon adriaticus*** in "Fauna del Regno di Napoli" (Crostacei; Pandalus):7 in 1844-1847. It is clear that with ***Palinurus adriaticus*** Carus really meant ***Palaemon adriaticus*** Costa, since he cited textually Costa's diagnosis for that species. It is interesting that Carus (1885:474) listed ***Palaemon adriaticus*** Costa under the species incertae of the genus ***Palaemon***, again with the same diagnosis.





anterior part of carapace (dorsal view)

Fig. 224

FAO Names : **En** - Common spiny lobster; **Fr** - Langouste rouge; **Sp** - Langosta común.

Type : Type locality of ***Astacus elephas*** Fabricius, 1787 (and ***Palinurus quadricornis*** Fabricius, 1798): the original statement of the type locality "Habitat in Americae meridionalis Insulis" is erroneous. As shown in Fabricius' description of the large supraorbital horns as dentate, and by his reference to Herbst's (1792:2(2): pl.29 fig.1), his specimen was the common European spiny lobster (in 1787 Fabricius referred to the then still unpublished figure by Herbst). Herbst gives as the locality of his material: 'im Mittelländischen Meer" and elaborates: "In Italien wird er ... häufig gegessen und auf den Markten verkauft". We may therefore correct the type locality to "Italy". A syntype, originally preserved dry, but recently transferred to alcohol is kept in UZM, condition reasonable. A second dry syntype is in ZMB, no. 19649, condition good; this is the specimen figured by Herbst, 1792.

Type locality of ***Cancer locusta*** Wulfen: near Rovinj, Yugoslavia. The type was bought at the fish market of Trieste, Italy (for 2 florins) from a fisherman from Rovinj: "Non aliter, quam duorum florenorum pretio hunc mihi Tergestino in foro Cancrum piscator vendidit Rovignensis" (Wulfen, 1791:314); its present whereabouts unknown.

Type locality of ***Palinurus vulgaris*** Latreille: "dans l'Ocean Asiatique et dans la Mediterranée". Types in MP no longer extant (not located in 1989).

Type locality of ***Palinurus marinus*** Bate, 1868. The name "marinus" probably is a lapsus for "vulgaris", but if the specific names is considered to be new, the type locality of the species is the south coast of Devon and Cornwall, U.K. "mostly between Bigbury Bay [Devon] toward the east, and the Dodman [Cornwall] toward the west"; whereabouts of type material unknown.

Type locality of ***Pagurus maculatus*** Bowdich: Madeira. Types probably no longer extant.

Geographical Distribution : Eastern Atlantic, from southwestern Norway to Morocco, also in the Mediterranean, except the extreme eastern and south eastern parts (Fig. 225).

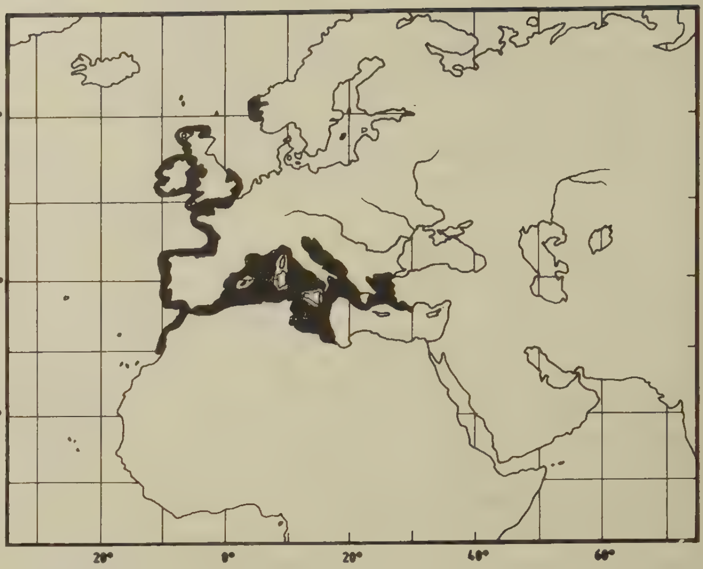


Fig. 225

Habitat and Biology : On rocky bottoms, rarely on sand, in depths from 5 to 160 m, mostly between 10 and 70 m. Ovigerous females from September-October to February-March.

Size : Maximum total body length 50 cm, but usually not larger than 40 cm.

Interest to Fisheries : The species is mostly caught with lobster pots, occasionally on hook-and-line and by spearing, rarely with trawls, tangles, or trammel nets. Longhurst (1970:260) reported the catching of this species "by full-time SCUBA divers off southwest England". In the central and western Mediterranean the species is regularly found at fish markets, and in the eastern Atlantic, outside the Mediterranean, it is fished on a minor scale in England, and more intensively in France and Portugal. No catch statistcs are known, but probably the catches of ***Palinurus*** spp. reported in the FAO Yearbook of Fisheries Statistics correspond partly to ***P. elephas*** and partly to ***P. mauritanicus*** (4921 tons in 1987 and 7869 tons in 1988).

Local Names : CYPRUS: Astakos; DENMARK: Langust; FRANCE: Langouste, Langouste commune, Langouste européenne; GERMANY: Languste, Europäische languste, Gemeine languste; GREECE: Astakis; ITALY: Aragosta mediterranea (official name), Aragosta, Aligusta, Arigusta; MALTA: Agusta; MONACO: Lengusta; MOROCCO: Azeffane, Bakhouche, Langouste; NETHERLANDS: Langoest, Hoornkreeft; NORWAY: Langust; PORTUGAL: Lagosta; SPAIN: Langosta, Llagosta; SWEDEN: Langust; TUNISIA: Jarradh el bahr, Jrad bharr, Sid; TURKEY: Bocek, Beudic; UK: Spiny lobster, Crawfish, Red crab, Sea crayfish; YUGOSLAVIA: Jastog.

Literature : Rolland, 1881:234 (for regional French names); Palombi & Santarelli, 1961:369-370 (for regional Italian names); Fischer, Bianchi & Scott (eds), 1981:vol. 5; Fischer, Bauchot & Schneider (eds), 1987:307-308.

Palinurus gilchristi Stebbing, 1900

Fig. 226

PALIN Palin 5

Palinurus gilchristi Stebbing, 1900, South African Marine Fisheries Investigations, 1:31, pl. 1.

FAO Names : **En** - Southern spiny lobster; **Fr** - Langouste du Sud; **Sp** - Langosta del sur.

Type : Type locality: "False Bay", southern Cape Province, South Africa, and "25 miles s.w. 1/4 w. from Cape St. Blaize" near Mosselbaai, Cape Province, South Africa; syntype male in SAM, no. A 970 (in alcohol).

Geographical Distribution : South Africa: south coast of Cape Province from False Bay to Port Alfred (from 18°30' to 27°E). Also reported from the Fort Dauphin area of Madagascar (Crosnier & Jouannic, 1973:13) (Fig. 227).

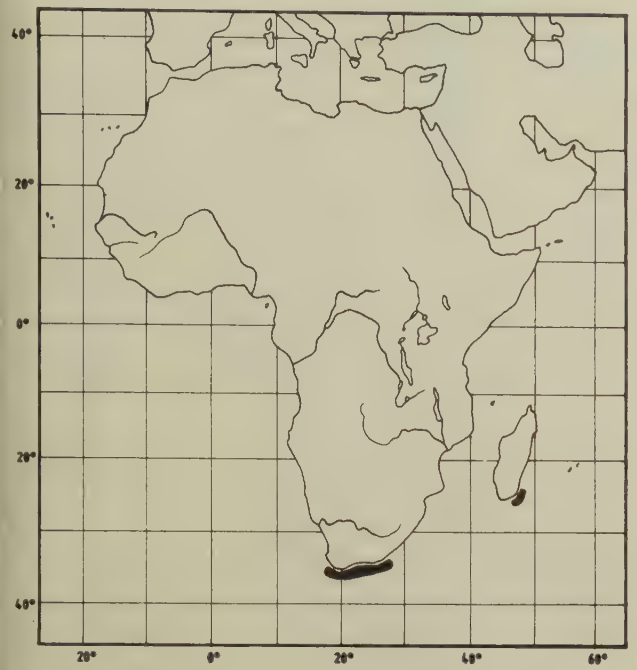
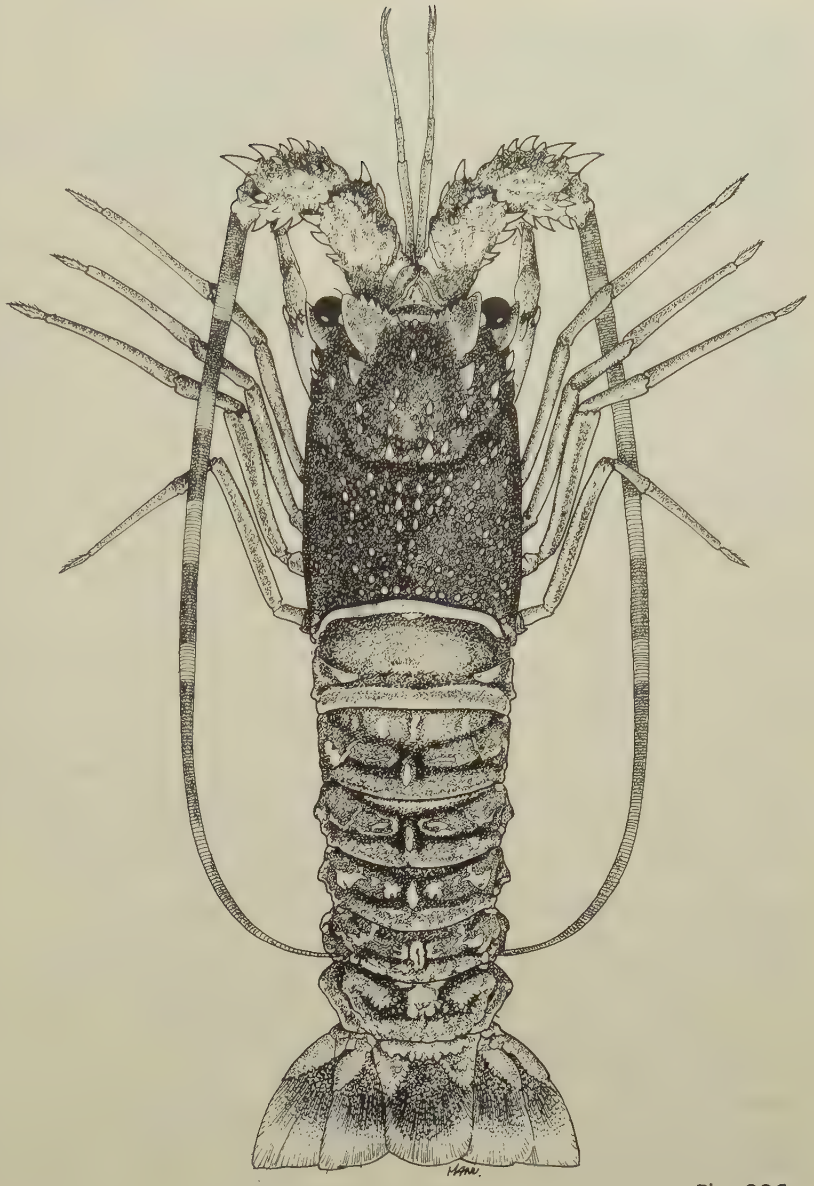


Fig. 227

Habitat and Biology : The species has been reported from depths between 55 and 360 m; it inhabits rocky areas and shelters in the crevices of the rocks.

Size : Maximum total body length 16 cm (males) and 31 cm (females). The recorded carapace lengths vary from 3 to 13 cm, usually between 6 and 10 cm.



(after Berry & Plante, 1973)

Fig. 226

Interest to Fisheries : According to Berry (1971:18) the species did not support a commercial fishery. But Pollock & Augustyn (1982:57-73) reported that commercially exploitable densities of this species were discovered near the edge of the continental shelf between Cape Agulhas and Port Alfred in about 110 m depth. The FAO Yearbook of Fisheries Statistics reports annual catches of 1820 metric tons in 1987 and 880 tons in 1988, all by South Africa. Near Fort Dauphin, Madagascar, Crosnier & Jouannic (1973:13) found only small quantities of lobsters in areas with rocky bottoms difficult to exploit with the gear available to them.

Local Names : SOUTH AFRICA: Gilchrist's crayfish (Barnard, 1950:542).

Literature : Berry, 1971:1-23; Berry & Plante, 1973:373-380, pls 19, 20; Pollock & Augustyn, 1982:57-73; Williams, 1986:15, figs 34, 78 h-i.

Palinurus mauritanicus Gruvel, 1911

Fig. 228

PALIN Palin 3

Palinurus vulgaris mauritanicus Gruvel, 1911, Annales Institut oceanographique, Monaco, (3)4:22, pl. 1 fig. 4

Synonyms: ***Palinurus vulgaris inflata*** Gruvel, 1910 (not ***Palinurus inflatus*** Bouvier, 1895 (= ***Panulirus inflatus*** (Bouvier)); ***Palinurus thomsoni*** Selbie, 1914.

FAO Names : **En** - Pink spiny lobster; **Fr** - Langouste rose; **Sp** - Langosta mora.

Type : Type locality: (for ***P. v. inflata*** and ***P. v. mauritanicus***)" sur toute la côte mauritanienne, du cap Barbas [= Cabo Barbas, western Sahara, 22°18'N, 46°41' W] jusque un peu au nord de Saint-Louis [Sénégal, 16°01'N, 16°30'W], par des fonds de 20 m à 50 m et souvent sur le sable coquillier". Syntypes in MP, no longer extant (not located in 1989).

Type locality of ***P. thomsoni***: "58 mls. W. 1\2 N of Blackball Head [S.W. Ireland], 51°20'N., 11°30'W., 212-229 fms [= 388-420 m], sand" Holotype male in NMI, no. 104.1916, in good condition in alcohol.

Geographical Distribution : Eastern Atlantic from W. of Ireland (53°N) to southern Senegal (14° N), also in the western Mediterranean, West of about 16°E, not in the Adriatic (Fig. 229).

Habitat and Biology : Depth range from 180 to 600 m. In the western Mediterranean mostly between 400 and 500 m. On rocky and coral substrates, as well as on mud. At times gregarious. Trawl hauls of 200 to 500 specimens have been recorded off N.W. Africa.

Size : Maximum total body length 50 cm; a single record of a specimen of 75 cm needs confirmation. Usually the body length ranges between 20 and 40 cm.

Interest to Fisheries : The main commercial fishery of the species is off N.W. Africa. At its inception, this fishery was mainly operating by trawls, especially after 1954. From 1958 onwards, however, the lobster-pot fishery gradually replaced trawling. In the western Mediterranean, the commercial importance of the species is not very high, but it is regularly taken by deep sea trawlers as a bycatch. It is brought to the markets in Spain and Italy, but it is far from frequent there. Sold mostly fresh, sometimes frozen. Catch statistics are not recorded for this species. However, the figures given for ***Palinurus*** spp. in the FAO Yearbook of Fishery Statistics most probably correspond to mixed catches of ***P. elephas*** and ***P. mauritanicus*** (4921 metric tons in 1987 and 7869 tons in 1988).

Local Names : FRANCE: Langouste rose, Langouste du large; ITALY: Aragosta bianca, Aragosta mauritanica; MOROCCO: Azeffane, Bakhouche, Langousta; SENEGAL: Soum, Soumpé; SPAIN: Langosta rosada, Langosta roja.

Literature : Fischer, Bianchi & Scott (eds), 1981:vol. 5; Fischer, Bauchot & Schneider (eds), 1987:309-310.

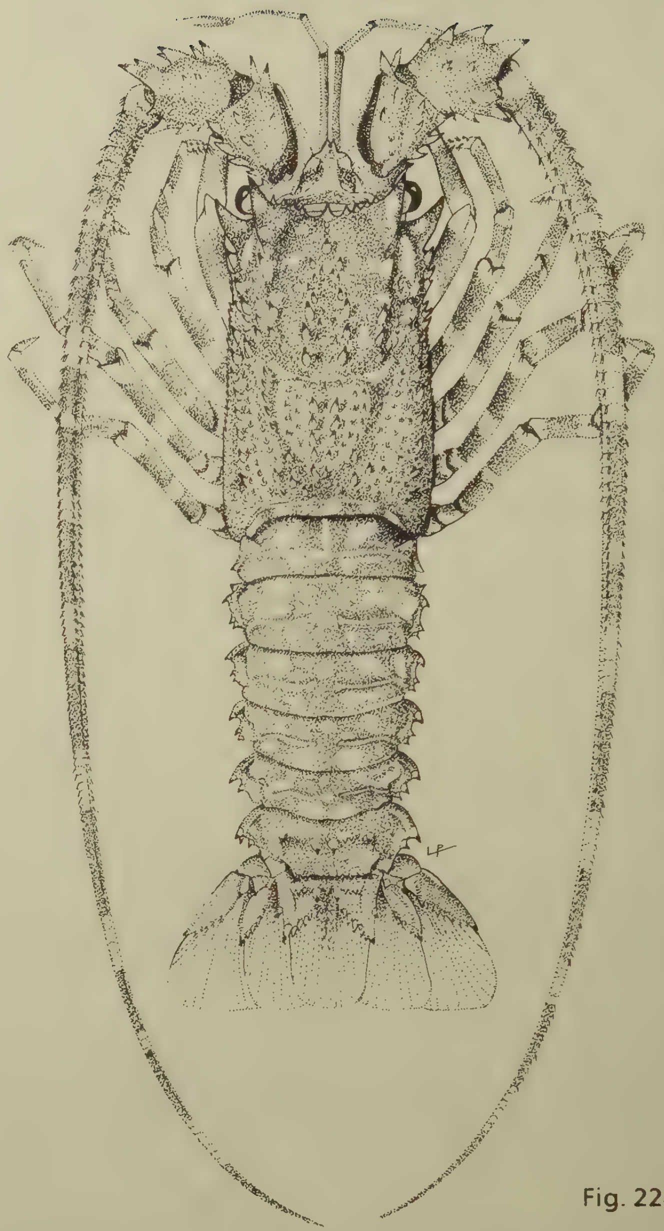


Fig. 228

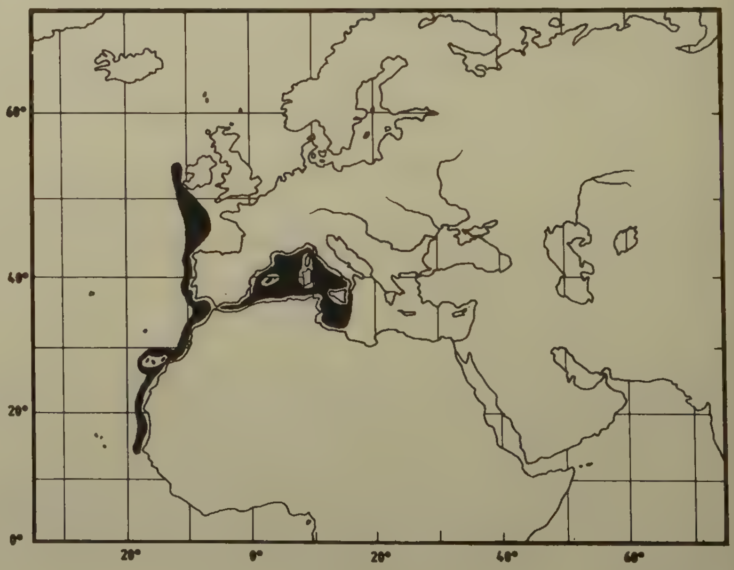


Fig. 229

Palinustus A. Milne Edwards, 1880

PALIN Palinus

Palinustus A. Milne Edwards, 1880, Bulletin Museum Comparative Zoology, Harvard College, 8(1):66. Gender masculine. Placed on the Official List of Generic Names in Zoology in Opinion 519 (published in 1958).

Type Species : by monotypy: ***Palinustus truncatus*** A. Milne Edwards, 1880.

The genus is characterized by the shape of the frontal horns, that do not end in a sharp point but in a broad, bluntly truncated top that sometimes is crenulated; a strong spine is present on the outer margin of each horn.

Four species have been described of this genus, none with any commercial value as the species all seem to be very scarce and all occur at considerable depths. The taxonomic status of some of the species is not yet clear.

From the data in the literature it seems most likely that almost all the specimens, other than the type material, that have been identified as ***Palinustus mossambicus*** do not belong to that species but must be assigned to ***Palinustus waguensis***. This assumption, which still has to be proven by thorough study of an extensive material, has been adopted here, admittedly without sufficient basic data. However, this seems the best solution at the present time.

Tentative Key to Species:

1a. Anterior margin of carapace between the frontal horns convex, with a single median spine; no other spines on this margin, but a single, small denticle on the inner margin of each horn (Fig. 230a). Epistome with 5 to 7 spines on the anterior margin, and small spines in the anterolateral corner (Natal, South Africa) .... ***P. unicornutus*** (Fig. 235)

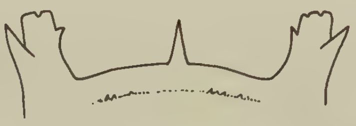
1b. Anterior margin of carapace between the frontal horns straight or convex, with two or more spines. Epistome with spinules or tubercles on the anterior margin; anterolateral corners with a single spine or unarmed

  2a. A strong median spine, in addition to several others, on the anterior margin of the carapace between the frontal horns. Inner margin of the horns without spines (230b). Epistome with 5 tubercles on the anteromedian margin; anterolateral corner with a strong spine. Western Atlantic .... ***P. truncatus*** (Fig. 233)

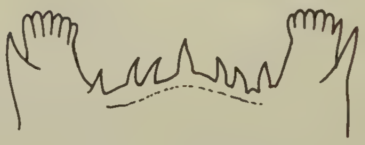
  2b. No median spine on anterior margin of carapace. Epistome with tubercles or spinules on anteromedian margin; anterolateral corner with a small spine or unarmed. Indo-West Pacific.

    3a. Anterior margin of carapace between frontal horns with a single pair of strong submedian spines; rest of the margin as well as the inner margin of the horns unarmed or with 2 very small spinules (Fig. 230c). Deep sea (406 m), but also reported from 59 to 61 m. East Africa (Somalia, Mozambique) .... ***P. mossambicus*** (Fig. 231)

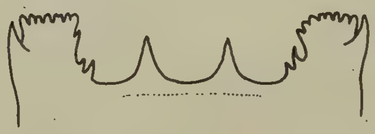
    3b. Anterior margin of carapace as well as inner margin of the frontal horns with several distinct spines (Fig. 230d). Shallow water form, 0 to 180 m. Indo-West Pacific region (India, Thailand, Philippines, Japan) .... ***P. waguensis*** (Fig. 237)



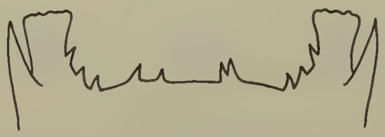
a. ***P. unicornutus***



b. ***P. truncatus***



c. ***P. mossambicus***



d. ***P. waguensis***

anterior margin of carapace (dorsal view) Fig. 230

Palinustus mossambicus Barnard, 1926

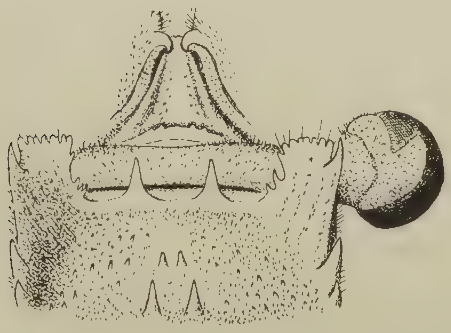
Fig. 231

PALIN Palinus 2

Palinustus mossambicus Barnard, 1926, Transactions Royal Society South Africa, 13:126, pl. 11.

FAO Names : **En** - Buffalo blunthorn lobster.

Type : Type locality: Off Mozambique, "25° S., 33°10'E., 406 metres, mud". This position cited by Barnard (1926) is definitely incorrect, as it would be on dry land; it is possible that a number of minutes has to be added to 25° S. Holotype male in SAM, no. A 10684 (in alcohol; condition good).



anterior part of carapace (dorsal view)
(from Barnard, 1950)

Geographical Distribution : The species has been reported from East Africa (Mozambique and Somalia) (Fig. 232).

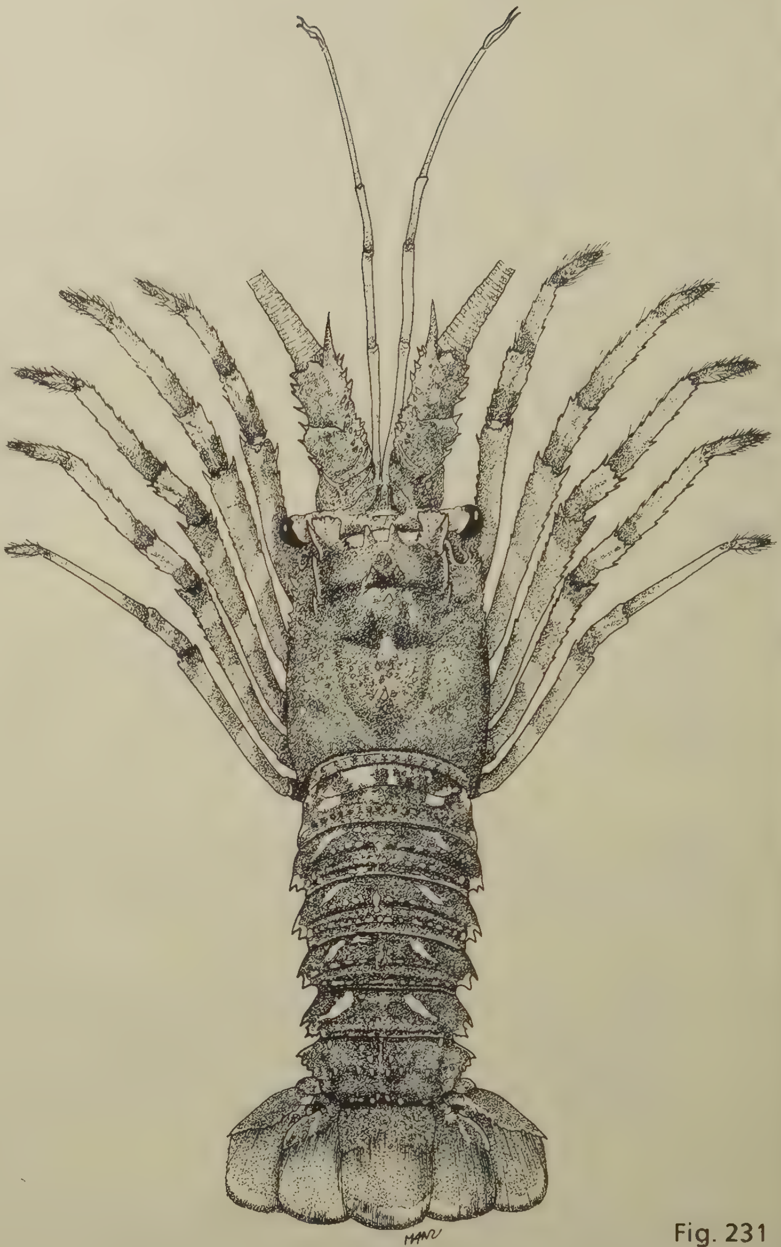
Habitat and Biology : Found in deep water (406 m) , but also in 59-61 m depth. Reported from a muddy substrate.

Size : Total body length 9.5 cm. Carapace length 3 cm.

Interest to Fisheries : So far none. Very little is known of this species of which only very few specimens have been found.

Literature : Barnard, 1950:545, figs 102 a,b; Berry, 1979:88,89, fig. 1A.

Remarks: Specimens reported under the name ***P. mossambicus*** from India and the Philippines have here, provisionally, been assigned to ***P. waguensis***. The status of these two species, however, needs further investigation.



(after Barnard, 1926)

Fig. 231

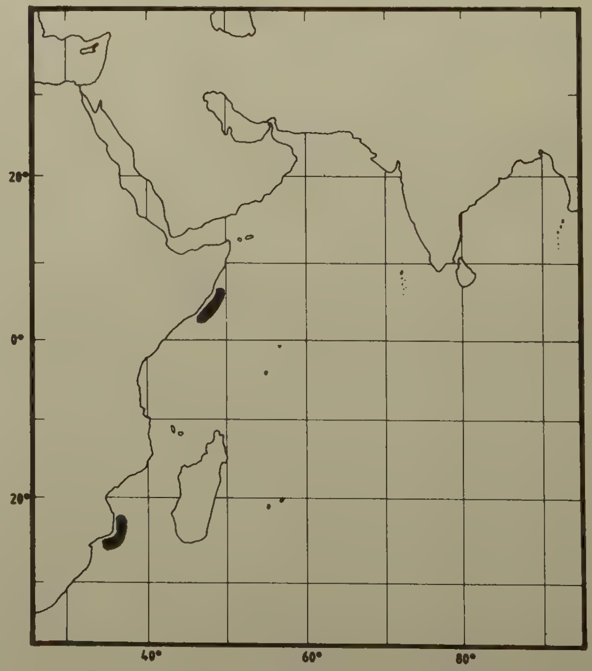


Fig. 232

Palinustus truncatus A. Milne Edwards, 1880

Fig. 233

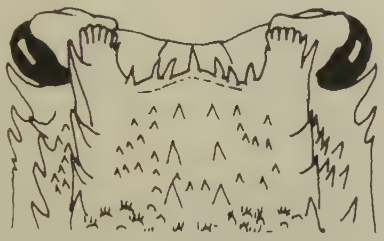
PALIN Palinus 1

Palinustus truncatus A. Milne Edwards, 1880, Bulletin Museum Comparative Zoology, Harvard College, 8:66. Name placed on the Official List of Specific Names in Zoology in Opinion 519 (published in 1958).

Synonyms: ***Palinurus truncatus*** - Gruvel, 1911.

FAO Names : En - American blunthorn lobster; **Fr** - Langouste aliousta; **Sp** - Langosta ñata.

Type : Type locality: "Blake" "Station No. 241. Profond. 163 brasses. Cariacou" (= off the Grenadines, 12°28'22"N, 61°32'18"W, 163 fms (= 298 m), sand and coral): type in MCZ.



anterior part of carapace (dorsal view)

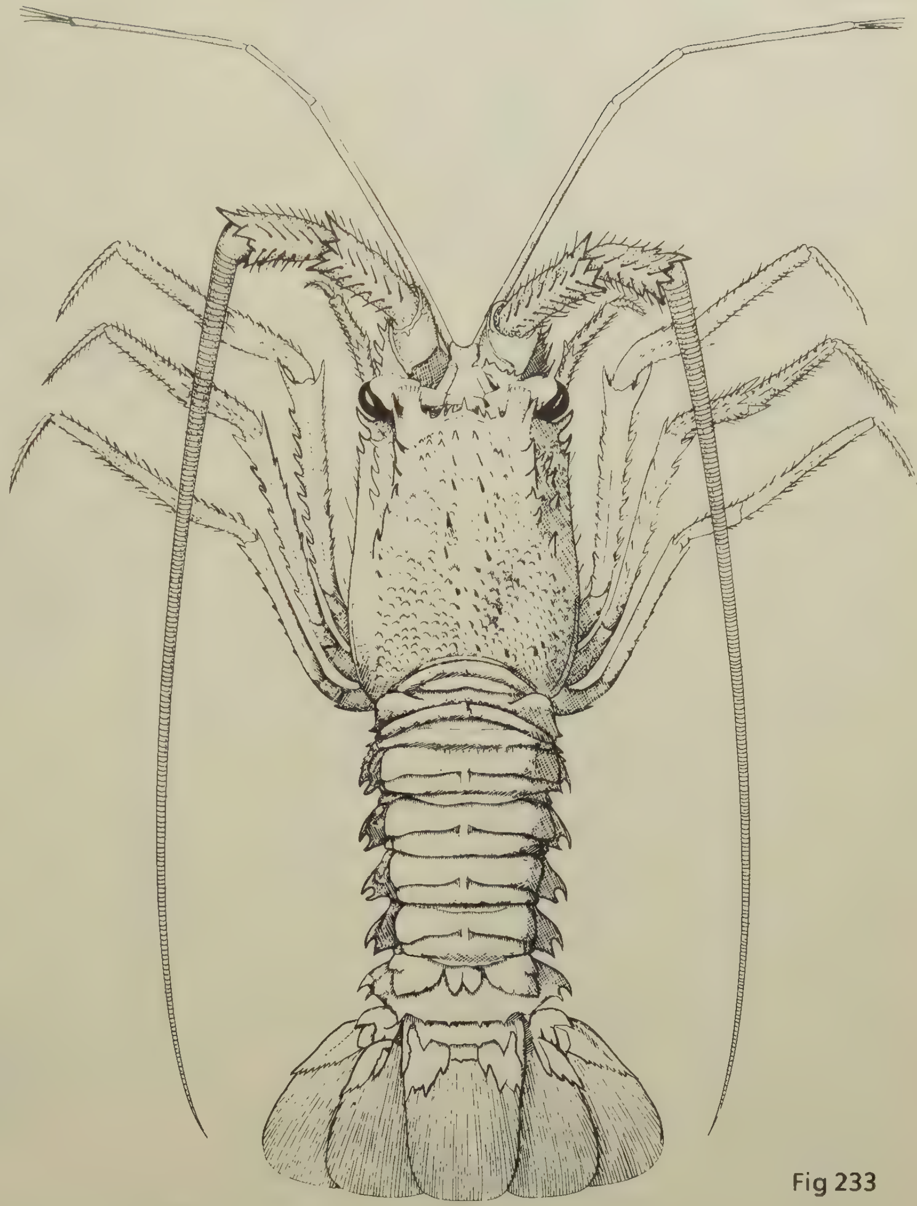


Fig 233

Geographical Distribution : Western Atlantic: from Carriacou Island, Grenadines, to off the mouth of the Amazon River, Amapá and Pará States, Brazil (Fig. 234).

Habitat and Biology : The species has been taken in depths between 120 and 298 m, but there is a record from the littoral zone, and one from 4111-4122 m. The bottom is variously described as "sand and coral", "sandy calcarenite", and "smooth, consisting of brown mud".

Size : Carapace lengths of 1.6 to 3.2 cm have been reported, the known maximum body length is 10 cm.

Interest to Fisheries : So far none. The species is evidently rare, and perhaps has a restricted range. Better knowledge of its occurrence and habits is required for deciding whether a future fishery will prove feasible.

Literature : Fischer (ed.), 1978: vol. 6.

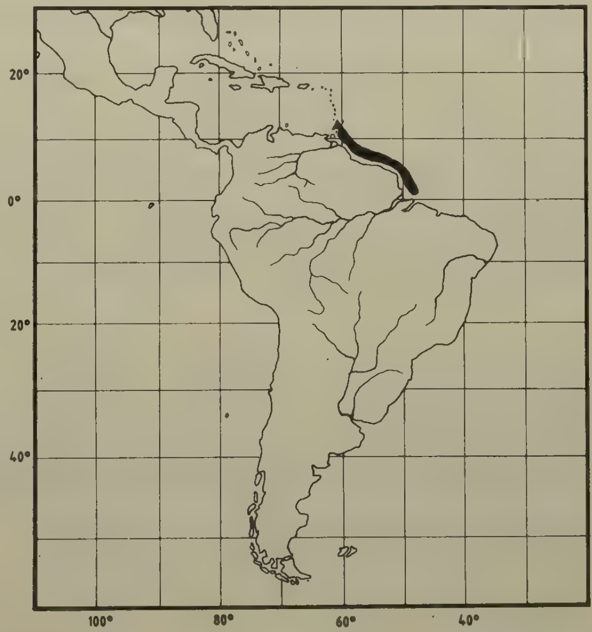


Fig. 234

Palinustus unicornutus Berry, 1979

Fig. 235

PALIN Palinus 3

Palinustus unicornutus Berry, 1979, Annals South African Museum, 78(9):93, figs 1,2,3G.

FAO Names : En - Unicorn blunthorn lobster.

Type : Type locality: "Due east of Boteleur Point, Natal (approximately 26°57'S 32°58'E). Depth 390 m"; holotype ovigerous female in SAM, No. A 15880 (in alcohol, condition good); paratype in SAM, No. A 15881 (in alcohol condition good).

Geographical Distribution : Off Natal, South Africa (off Boteleur Point, and off Park Rynie, ca. 30°19'S 30°56'E) (Fig. 236).

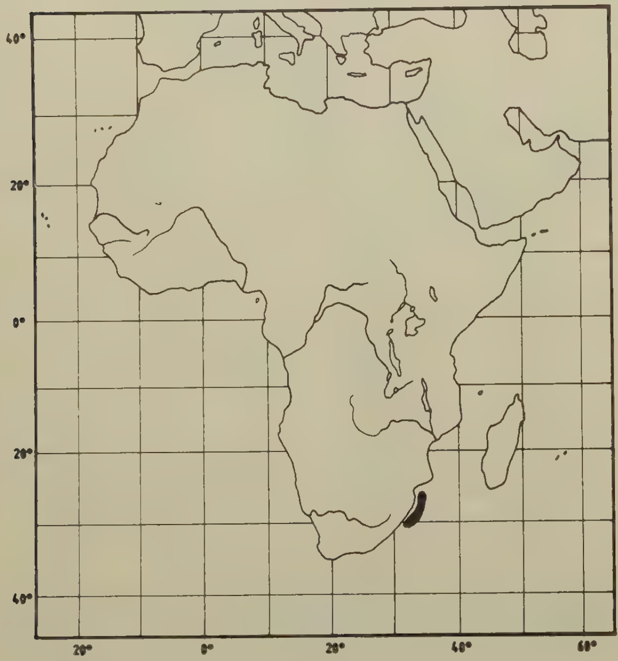
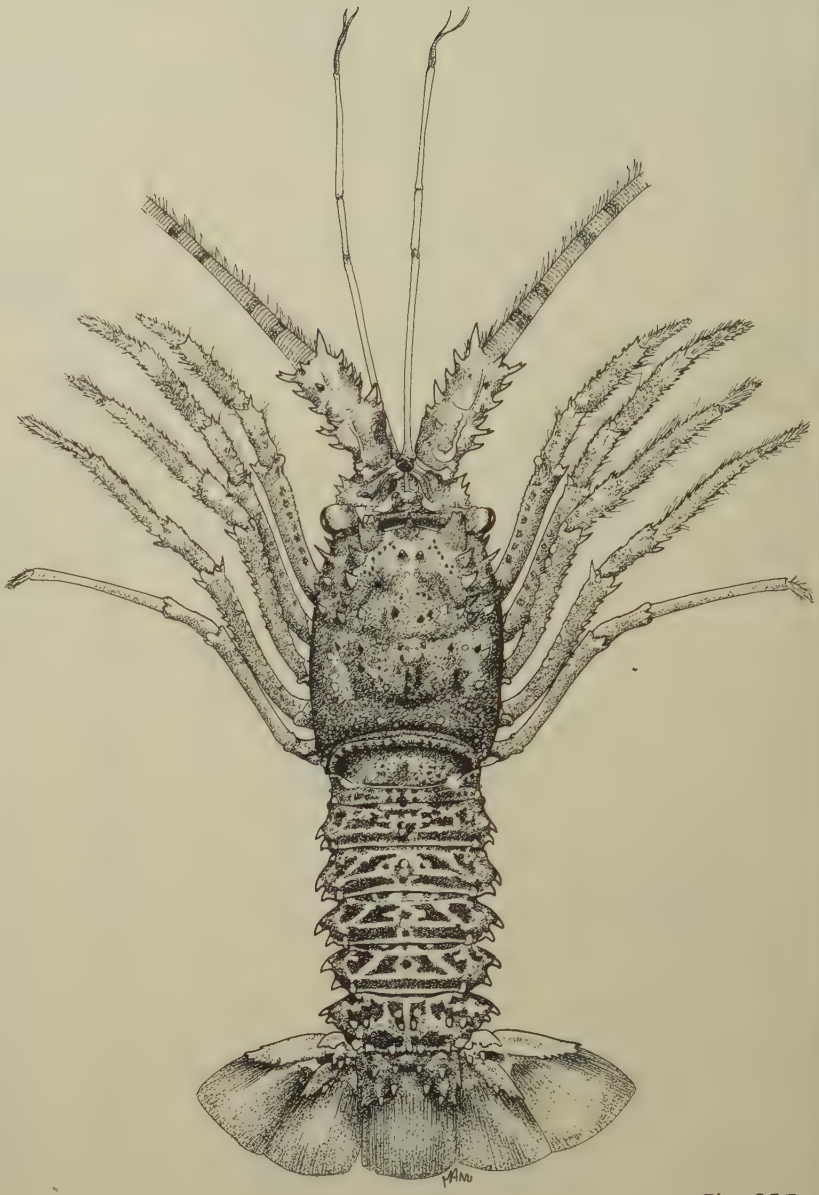


Fig. 236



(after Berry, 1979)

Fig. 235

Habitat and Biology : Depth range from 305 to 390 m.

Size : The two known specimens (both females) have a total body length of 14.2 cm (ovigerous female) and 13.4 cm, corresponding to a carapace length of 4.8 and 4.4 cm.

Interest to Fisheries : Since only 2 specimens are known, captured in lobster pots,it is clear that so far there is no fishery for the species.

Literature : Original publication.

Palinustus waguensis Kubo, 1963

Fig. 237

PALIN Palinus 4

Palinustus waguensis Kubo, 1963, Journal Tokyo University Fisheries, 49(1):63, figs 1-3.

FAO Names : En - Japanese blunthorn lobster.

Type : Type locality: "Shallow waters in the vicinity of Wagu, Mie Prefecture", Honshu, Japan; whereabouts of holotype male unknown.

Geographical Distribution : Indo-West Pacific region. The species so far is only known from Honshu Island, Japan, viz. from Wagu and Kii-nagashima, both Mie Prefecture, and from Sagami Bay. Sekiguchi & Okubo (1986) mentioned 15 specimens from the east and south coast of Kii peninsula (Mie and Yamagata prefectures) without giving precise localities. What is believed to be this species has been reported under the name ***P. mossambicus*** from S.W. India and the Philippines (Sulu Sea). In the Zoological Museum at Copenhagen there is a juvenile (cl. 8 mm) from the Bay of Amboina (Moluccas, Indonesia). Specimens from the Andaman Sea near Ranong, Thailand, are present in Chulalongkorn University, Bangkok and RMNH (Fig. 238).

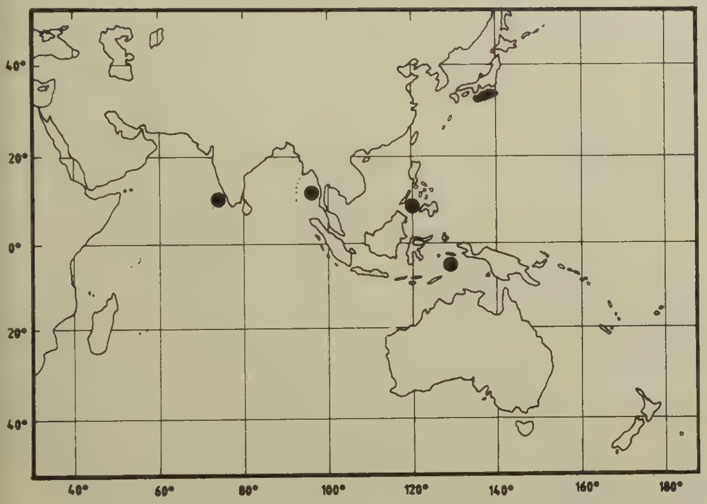
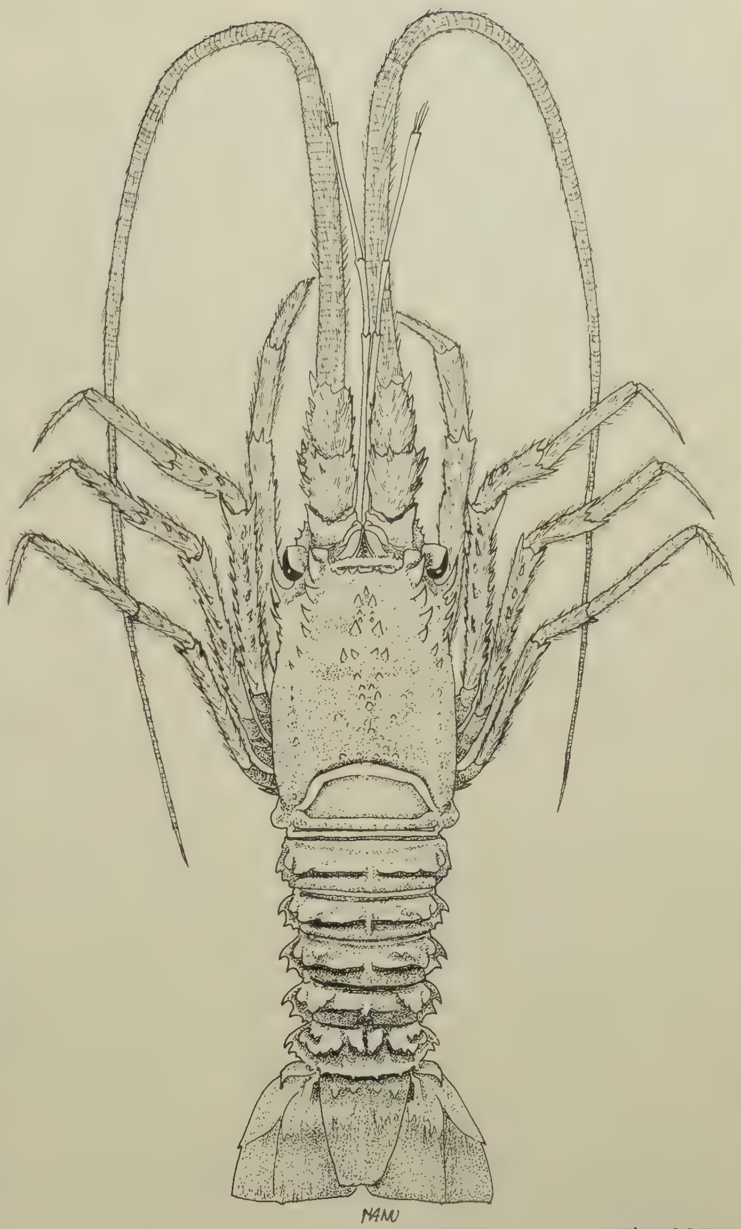


Fig. 238



(after Kubo, 1963)

Fig. 237

Habitat and Biology : Reported from rather shallow water in Japan, where it sometimes is caught in lobster trap nets. The specimens from India and the Philippines were taken in depths between 72 and 84 m, the juvenile from Amboina came from a depth of "ca. 100 fms" (about 180 m), from a stony bottom. Some data on the biology and body posture are published by Sekiguchi & Okubo (1986).

Size : Total body length 5 to 10 cm, carapace length 0.8 to 3.2 cm.

Interest to Fisheries : In Japan there is no commercial fishery for this relatively rare species, but fishermen obtaining specimens in their lobster nets (which in Japan can only be legally used from October to April), often give or sell these specimens to the public aquaria on the Japanese east coast. George (1973), however, reported that the species, he had indicated as ***P. mossambicus***, has been obtained in large numbers from certain localities in India and that it may be the object of a fishery there (Kurian & Sebastian, 1982:162).

Local Names : JAPAN: Wagu-ebi.

Literature : Berry, 1979:88,89, fig.3; Sekiguchi & Okubo, 1986:19-26.

Remarks : The taxonomic status of this species vis à vis ***P. mossambicus*** is far from clear, and a closer study of the complex is highly desirable.

Panulirus White, 1847

PALIN Panul

Panulirus White, 1847, List of the Crustacea in the collection of the British Museum:69. Gender masculine. Name placed on the Official List of Generic Names in Zoology, in Opinion 507 (published in 1958).

Type Species: selected by Holthuis, 1956 (Bulletin of zoological Nomenclature, 12:55): ***Palinurus japonicus*** Von Siebold, 1824.

Synonyms: ***Phyllosoma*** Leach, 1817, in Tuckey, Narrative of an expedition to explore the River Zaire: plate without number. Type species, selected by Holthuis, 1956 (Bulletin of zoological Nomenclature, 12:55): ***Phyllosoma commune*** Leach, 1817 (= ***Panulirus regius*** De Brito Capello, 1864). Gender neuter. Name suppressed under the plenary power of the International Commission on Zoological Nomenclature in their Opinion 507 (published in 1958), and placed on the Official Index of Rejected and Invalid Names in Zoology.

Senex Pfeffer, 1881, Verhandlungen naturwissenschaftlichen Vereins Hamburg, 5:30. · Replacement name for, and thereby objective junior synonym of ***Panulirus*** White, 1847; junior homonym of ***Senex*** Gray, 1838 (Aves). Gender masculine. Name placed on the Official Index of Rejected and Invalid Names in Zoology in Opinion 507 (published in 1958).

A circumtropical genus of large, often brightly coloured, spiny lobsters. All of the 19 species known are to a greater or lesser extent of commercial interest. All are treated below.

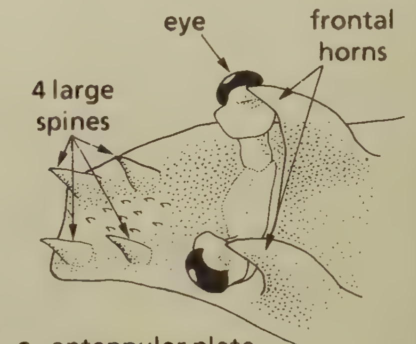
Key to Species:

1a. Abdominal somites with a distinct transverse groove, which may be interrupted in the middle. Third maxilliped with or without exopod

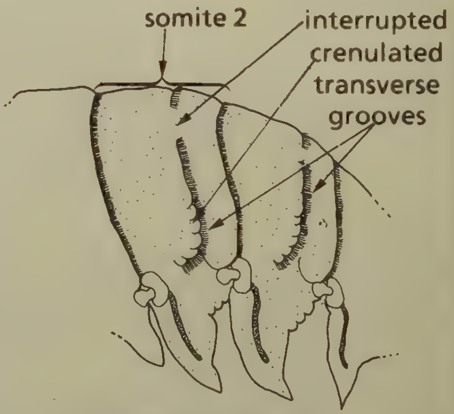
  2a. Anterior margin of transverse groove of abdominal somites crenulated. Groove itself either complete or interrupted in the middle (Fig. 239b). Antennular plate with 4 equal, large, well separated spines, arranged in a square with additional very small spinules scattered in between (Fig. 239a). Exopod of third maxilliped absent. Colour: body dark green or reddish brown, finely spotted with white. No distinct bands of light colour on the abdomen. A light anterior spot at the base of the abdominal pleura. Antennulae banded. Legs rather uniform in colour, sometimes with faint, longitudinal streaks. Indo-West Pacific .... ***P. homarus*** (Fig. 267)

  2b. Transverse groove of abdominal somites with straight margins, not crenulated

    3a. Antennular plate with 4 strong spines, which are fused at their bases, forming a single bunch of 4 diverging points; the anterior pair shorter than the posterior (Fig. 240a). Exopod of third maxilliped present, with flagellum. Transverse grooves over the abdominal somites usually uninterrupted (Fig. 240b). Colour: body greenish or reddish, ranging from yellowish green through brown green to blue-black or dark reddish brown; speckled on carapace and abdomen with tiny whitish spots. No transverse colour bands on abdomen, but two rather large whitish spots on first somite. Antennulae not banded. Legs with wider or narrower longitudinal yellowish lines or streaks on a dark (greenish or reddish) background. Indo-West Pacific .... ***P. penicillatus*** (Fig. 285)

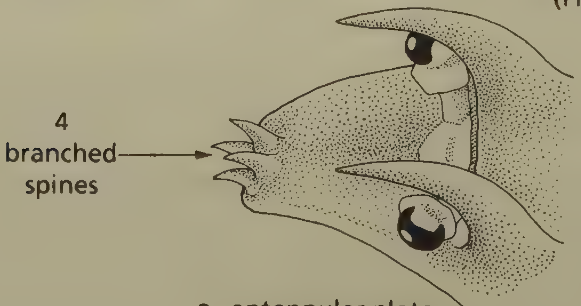


a. antennular plate

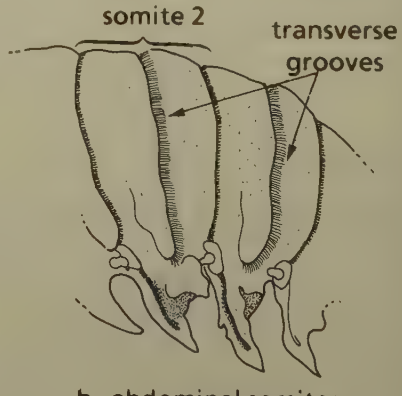


b. abdominal somites (lateral view)

P. homarus Fig. 239



a. antennular plate



b. abdominal somites (lateral view)

P. penicillatus Fig. 240

3b. Antennular plate with 2 or 4 large spines, which are widely separated from each other

4a. Antennular plate with 2 large spines, sometimes with scattered small spinules behind these (Fig. 241)

5a. The transverse grooves of abdominal somites 3 and 4 do not join the groove along the anterior margin of the corresponding pleuron (Fig. 242)

6a. Japanese species. Exopod of third maxilliped present, with flagellum. Body of a uniform dark brownish red colour. No pale bands on abdominal somites. Antennulae not banded. Pereiopods with some narrow longitudinal yelllowish lines. No conspicuous spots .... ***P. japonicus*** (Fig. 273)

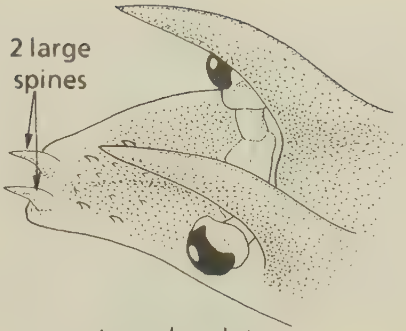
6b. Atlantic species (N.E. Brazil, Central Atlantic Islands from the Canary Islands to St. Helena). Exopod of third maxilliped reduced, without flagellum. Colour: body and especially the tail covered by distinct rounded whitish spots. Antennulae and legs streaked with yellowish or whitish longitudinal lines, not banded or spotted .... ***P. echinatus*** (Fig. 262)

5b. The transverse grooves of abdominal somites 3 and 4 join the groove along the anterior margin of the corresponding pleuron (Fig. 243, 244)

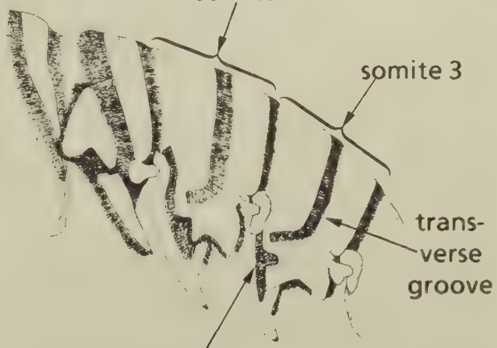
7a Transverse groove of abdominal somite 2 does not join the groove along the anterior margin of the corresponding pleura (Fig. 243). Exopod of third maxilliped present, with flagellum. Colour: body dark purple with some greenish, not speckled. Irregular pale bands along posterior margin of abdominal somites, sometimes with whitish spots mixed in with them; spots on basis of tail fan. Antennulae not banded. Legs with narrow pale longitudinal streaks. Only known from Easter and Pitcairn Islands .... ***P. pascuensis*** (Fig. 283)

7b. Transverse groove of abdominal somite 2 confluent with groove along anterior margin of corresponding pleura (Fig. 244)

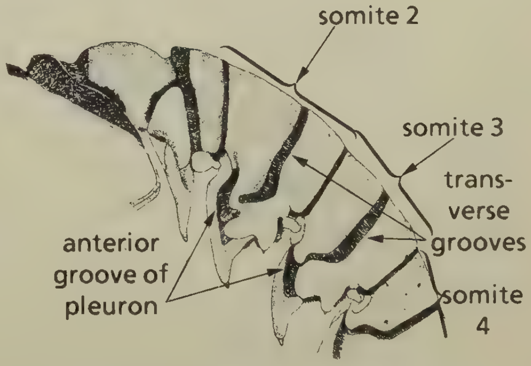
8a. Anterior margin of pleuron of abdominal somite 2 with distinct teeth (Fig. 244). Exopod of third maxilliped present, with flagellum. Colour: carapace with yellowish, reddish and brownish colour, not spotted. Abdomen bright to dark purple with a very conspicuous transverse yellow band over the middle of each somite. Legs rather uniform in colour, with a few spots, but not streaked. Antennulae rather uniform in colour. Upper surface of abdomen pubescent in the grooves only. Hawaiian Archipelago .... ***P. marginatus*** (Fig. 279)



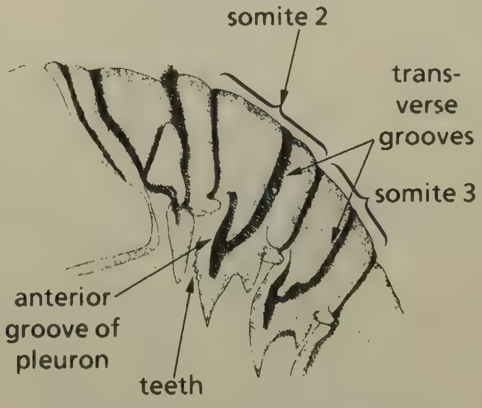
antennular plate
P. longipes Fig. 241



abdominal somites (lateral view)
P. japonicus Fig. 242



abdominal somites (lateral view)
P. pascuensis Fig. 243



abdominal somites (lateral view)
P. marginatus Fig. 244

8b. Anterior margin of pleura of abdominal somite 2 without distinct teeth. Colour: abdomen without a transverse light coloured band (although sometimes the hairs of the transverse groove may give the impression of such a coloured band), but with more or less distinct light spots. Legs with longitudinal streaks or with spots

9a. Abdominal somites with the grooves pubescent; a pubescent area on the dorsal surface of somites along the posterior margin (Fig. 245). Exopod of third maxilliped present and with flagellum. Colour: pale to dark purplish brown. Abdomen with widely scattered small pale spots, which sometimes are hardly noticeable. Antennulae uniform in colour or with a pale longitudinal streak. Legs pale or dark brown with longitudinal streaks. Western Australia .... ***P. cygnus*** (Fig. 259)

9b. No pubescent area on the abdominal somites behind the transverse groove. Colour: abdomen dark purple with numerous very conspicuous rounded whitish spots

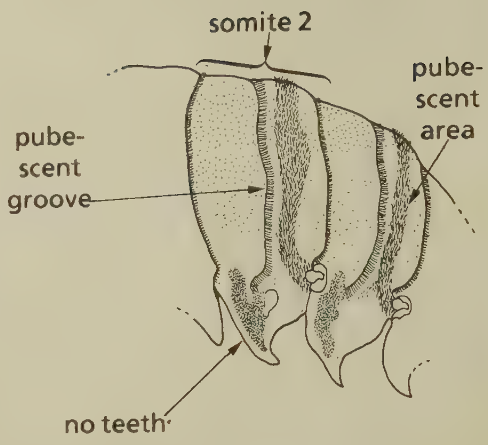
10a. Indo-West Pacific. Exopod of third maxilliped present, with flagellum. Colour: body, and especially the abdomen covered with numerous distinct round spots. Legs with light longitudinal streaks, which sometimes end just before a single pale spot. Antennulae with longitudinal streaks .... ***P. longipes*** (Fig. 277)

10b. Western Atlantic. Exopod of third maxilliped reduced, without flagellum. Body, especially abdomen with numerous distinct rounded pale spots. Also the legs spotted on carpus, merus and ischium, without streaks there; propodus longitudinally striped .... ***P. guttatus*** (Fig. 265)

4b. Antennular plate with 4 large spines arranged in a square (Fig. 246); scattered small spinules may be present in addition

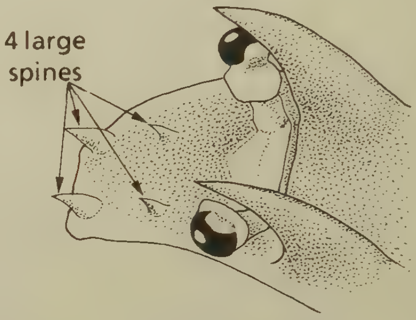
11a. Eastern Pacific. Exopodite of third maxilliped present, with flagellum. Transverse grooves of abdominal somites wide, abruptly interrupted in the middle (Fig. 247). Colour: body and abdomen dorsally rather uniformly brownish red, without light bands or spots. Legs brownish red with one or more pale longitudinal streaks. California (USA) and Baja California (Mexico) .... ***P. interruptus*** (Fig. 271)

11b. Atlantic. Transverse grooves of the abdomen, where interrupted, gradually narrowing towards the middle of the body, not ending abruptly. Colour: abdominal somites 2 and 6, or abdominal somites 2 to 6, with a single, large, white eyespot, surrounded by dark colour, on each half above the base of the pleuron



abdominal somites (lateral view)
P. cygnus

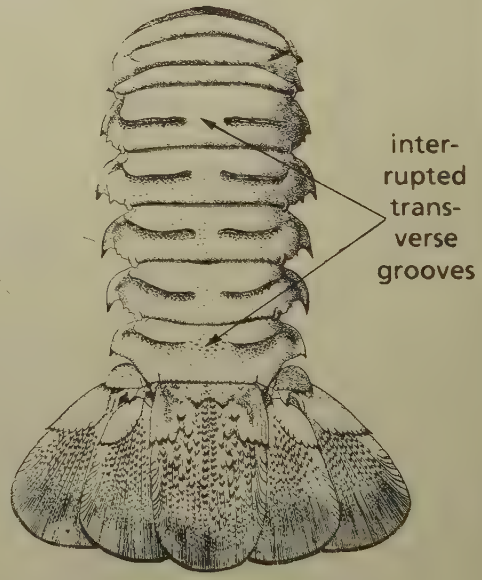
Fig. 245



antennular plate

P. ornatus

Fig. 246



abdomen (dorsal view)
P. interruptus

Fig. 247

12a. Eastern Atlantic. Third maxilliped without exopod. Colour: abdominal somites greenish with a very distinct white transverse band along the posterior margin and separated from that margin by a dark band. A distinct eyespot (white or yellowish surrounded by an open dark ring) above the bases of the pleura of somites 1 to 6; those of the posterior pleura smaller and more elongate than those of the anterior (Fig. 248). Tail fan rather uniformly greenish or brownish in colour .... ***P. regius***
(Fig. 289)

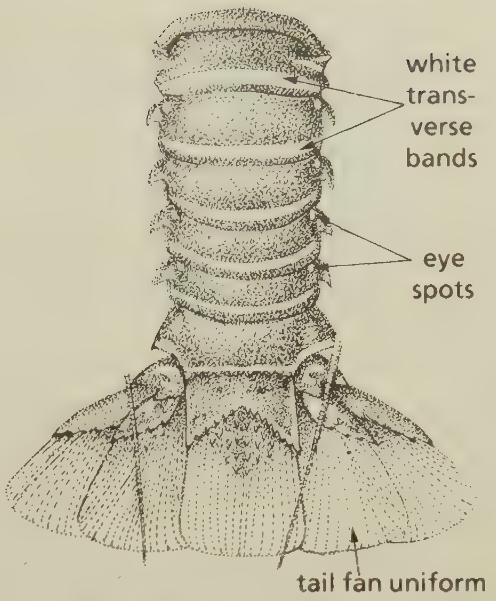
12b. Western Atlantic. Third maxilliped with an exopod provided with a flagellum. Colour: abdominal somites reddish or brownish, sometimes greenish, without transverse colour bands. A large eyespot of whitish or yellowish, surrounded by a dark colour is placed over the anterior end of the base of the pleura of abdominal somite 2, a similar, even slightly larger one in the anterolateral parts of somite 6. Tail fan with a broad transverse reddish band along or just before the posterior margin (Fig. 249) .... ***P. argus***
(Fig. 257)

1b. Abdominal somites smooth, without transverse groove. Third maxilliped without exopod

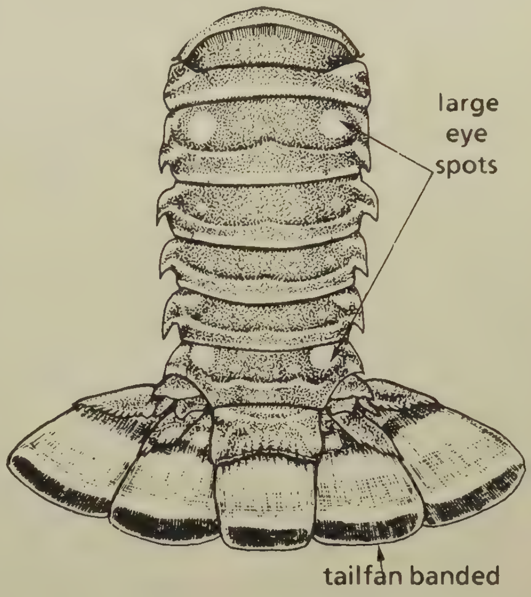
13a. Abdominal somites 1 to 6 with a distinct uninterrupted white transverse band along the posterior margin

14a. Antennular plate with 2 strong spines (Fig. 250a). Surface of abdominal somites naked and smooth. Colour: abdominal somites 2 to 5 with a white transverse band along the posterior margin which, however, is not set off by dark bands (Fig. 250b). Colour of body and abdomen usually greyish green without spots. Tailfan of a rather uniform colour. Legs irregularly spotted, not distinctly streaked. Indo-West Pacific .... ***P. polyphagus***
(Fig. 287)

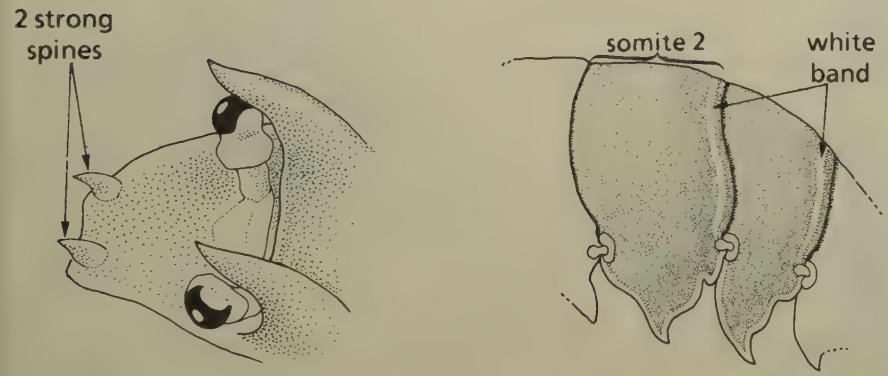
14b. Antennular plate with 4 strong spines arranged in a quadrangle (Fig. 252a). The whitish transverse bands along the posterior margin of the abdominal somites very distinct because they have a dark band in front and just behind them (Fig. 251, 252b)



abdomen (dorsal view) ***P. regius*** Fig. 248



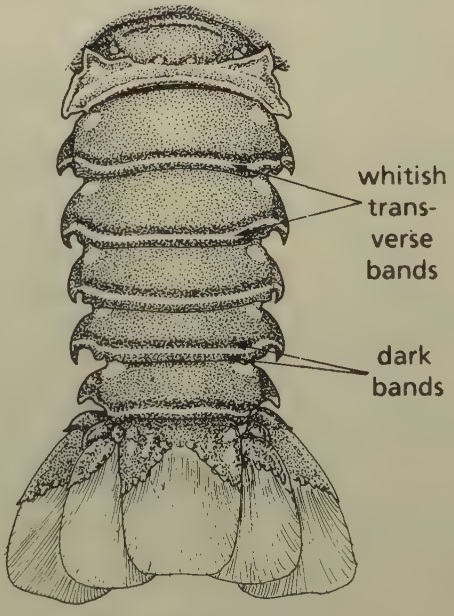
abdomen (dorsal view) ***P. argus*** Fig. 249



a. antennular plate

b. abdominal somites (lateral view)

P. polyphagus Fig. 250



abdomen (dorsal view)
P. gracilis

Fig. 251

15a. Eastern Pacific. Colour: carapace brownish or bluish green, almost uniform in colour or slightly and irregularly mottled. Antennae with the basal segments greenish, the flagella bluish green .... ***P. gracilis***
(Fig. 263)

15b. Indo-West Pacific. Colour: carapace whitish with well defined, sharply delimited areas of bluish black, which contrast very conspicuously with the light background. Antennal peduncles pink, the flagella white .... ***P. versicolor***
(Fig. 293)

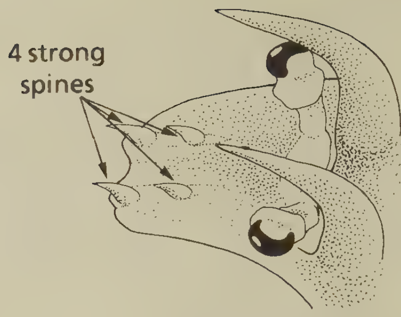
13b. Abdomen without distinct transverse bands on all somites, sometimes there is a line of pale spots there, or a narrow line is present on somites 1 to 3, but on somites 4 and 5 this is replaced by a row of spots. Antennular plate with 4 spines

16a. Abdominal somites 1 to 3 with a narrow transverse whitish line just before the posterior margin; somites 4 to 6 with a transverse row of rather large whitish spots there. Surface of abdominal somites smooth and naked (Fig. 253). Eastern Pacific .... ***P. inflatus***
(Fig. 269)

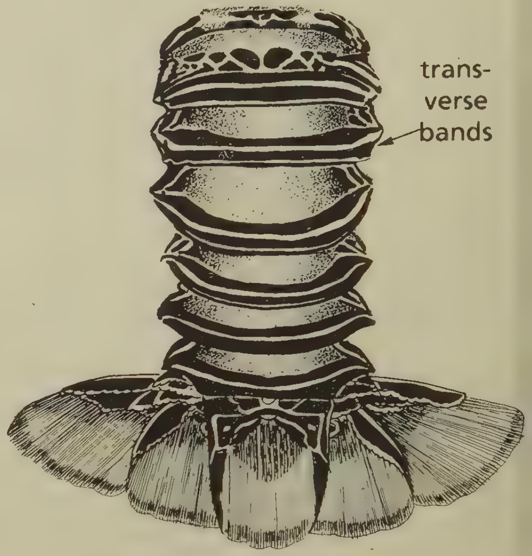
16b. Abdominal somites 1 to 6 without transverse whitish bands; if a row of spots is visible along the posterior margin, these spots are very minute and the rows are found on all somites

17a. Western Atlantic. A line of very small spots along the posterior margin of the abdominal somites, the rest of the upper surface of the abdomen not spotted. Pleura and hard part of tail fain with numerous very distinct spots in addition to a larger eye spot near the base of the pleura (Fig. 254). Frontal horns spotted .... ***P. laevicauda***
(Fig. 275)

17b. Indo-West Pacific. No line of small spots along the posterior margin of the abdominal somites. Colour of the abdominal pleura and of the hard part of the tail fan similar to that of the dorsal surface of the abdomen. Frontal horns with irregular transverse bands above, whitish below

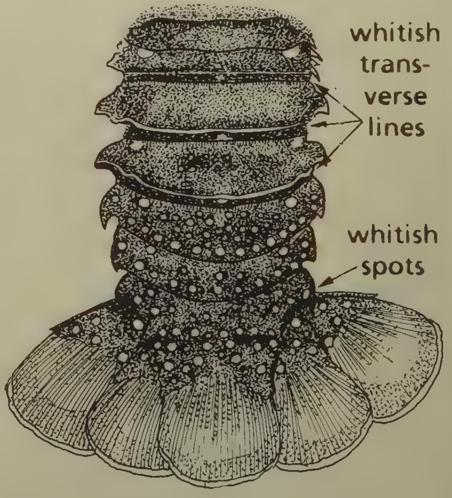


a. antennular plate (lateral view)



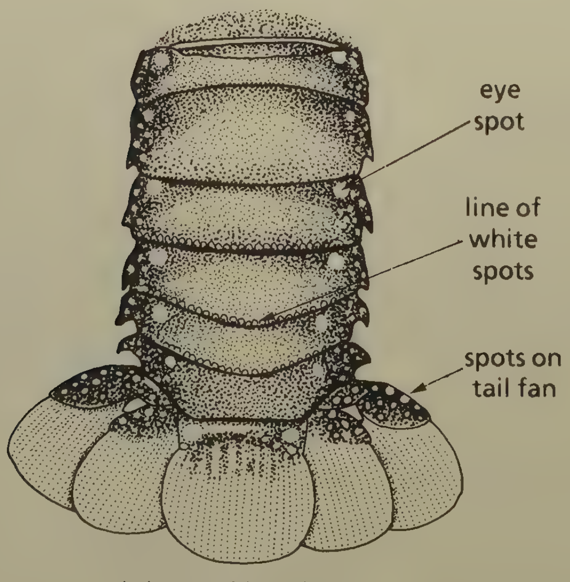
b. abdomen (dorsal view)

P. versicolor Fig. 252



abdomen (dorsal view)

P. inflatus Fig. 253

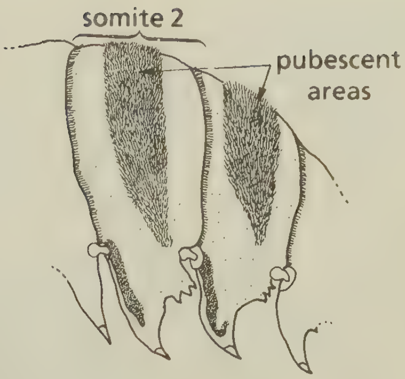


abdomen (dorsal view)

P. laevicauda Fig. 254

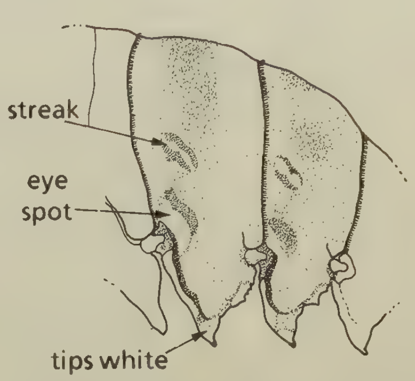
18a. Abdominal somites with a large pubescent area on each half of the dorsal surface (Fig. 255). The normal eyespot is present in the anterior half of the abdominal somites above the base of the pleura, but this spot is not accompanied by a light streak. Pleura without spots, but with a white line along the posterior margin. Tail fan of the same colour as the rest of the abdomen. Carapace without a peculiar marbling near the bases of the frontal horns. Legs longitudinally steaked .... ***P. stimpsoni***
(Fig. 291)

18b. Abdominal somites smooth and naked. Colour of abdomen brownish or greenish grey with at most minute indistinct speckles. The usual large eyespot in the anterior half near the base of the pleura is accompanied by an oblique pale streak placed somewhat mediad of the eyespot. The pleura have the tips white, sometimes this white colour extends slightly up the anterior and posterior margins (Fig. 256). Carapace with a peculiar and very characteristic marbling of pale lines near the bases of the frontal horns. Legs not streaked, but with very sharply defined irregular dark spots of a bluish or brownish colour, which often form incomplete rings around the various segments. Antennal flagella distinctly ringed .... ***P. ornatus***
(Fig. 281)



abdominal somites (lateral view)

P. stimpsoni Fig.255



abdominal somites (lateral view)

P. ornatus Fig.256

Panulirus argus (Latreille, 1804)

Fig. 257

PALIN Panul 1

Palinurus argus Latreille, 1804, Annales Muséum Histoire Naturelle, Paris, 3:393.

Synonyms: ***Palinurus ricordi*** Guérin-Méneville, 1836; ***Palinurus americanus*** H. Milne Edwards, 1837; ***Palinurus (Senex) argus*** - Pfeffer, 1881.

FAO Names : En - Caribbean spiny lobster; **Fr** - Langouste blanche; **Sp** - Langosta común del Caribe.

Type : Type locality of ***Palinurus argus***: unknown: "Je la soupçonne des Grandes-Indes", later corrected by Lamarck (1818) to "l'Océan du Bresil". Type material in MP: 3 possible syntypes from "Antilles", nos. Pa. 438, 439, 442 dry, in tolerable condition.

Type locality of ***Palinurus ricordi***: "aux Antilles". Lectotype (dry specimen in reasonable condition) in ANSP, no. 207 (Guérin coll. no. 276).

Type locality of ***Palinurus americanus***: "les Antilles". Syntypes in MP, possibly one, no. Pa. 443, left. "M. l'Herminier - Guadeloupe", a dry specimen in tolerably good condition.

Geographical Distribution : Western Atlantic: Bermuda and the east coast of USA at North Carolina, to Rio de Janeiro, Brazil, including the entire Gulf of Mexico and the Caribbean Sea (Fig. 258). Reported twice from West Africa (Ivory Coast).

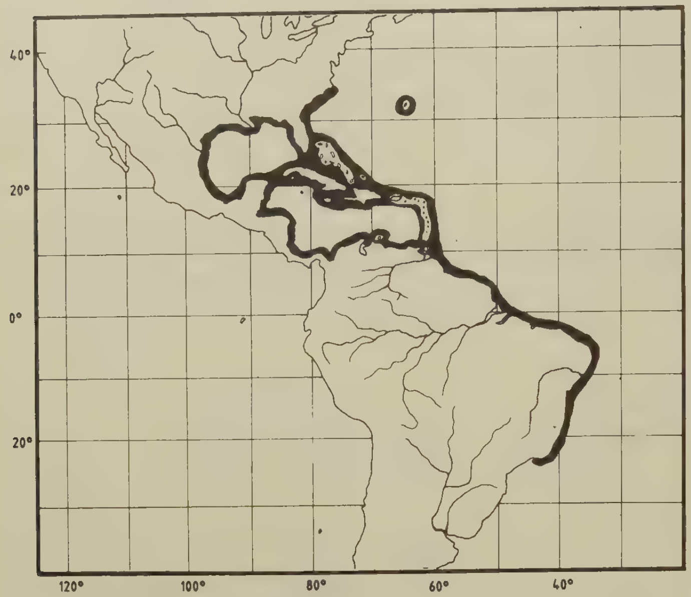


Fig. 258

Habitat and Biology : Inhabits shallow waters, occasionally down to 90 m depth, perhaps even deeper. Found among rocks, on reefs, in eelgrass beds or in any habitat that provides protection. The species is gregarious and migratory. Females move to deeper water for spawning and there are mass migrations in the autumn when the animals, in single files of up to 50 individuals, move in a certain direction in daytime, each animal having body contact with the next through the antennae. In the northern part of its range, larvae are found mainly from June to December.

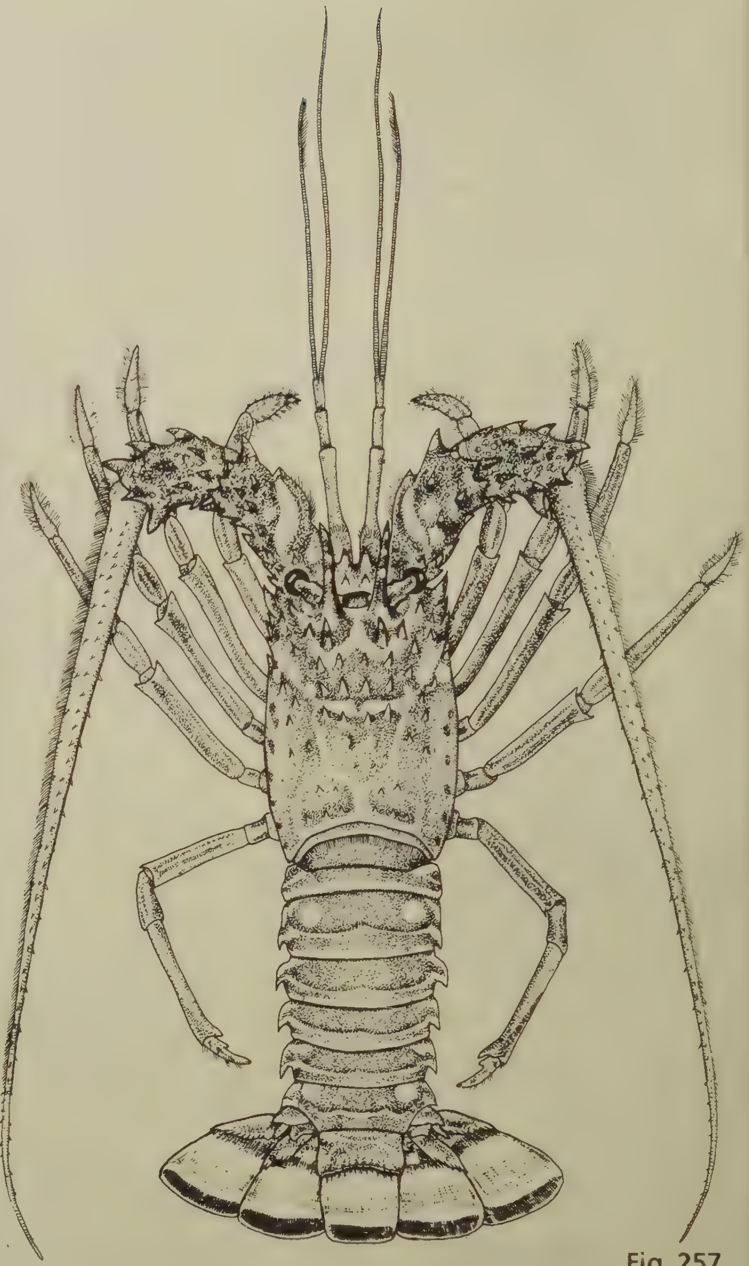


Fig. 257

Size : Maximum body length about 45 cm, average length to about 20 cm.

Interest to Fisheries : This is the most important commercial Palinurid in American waters. It is fished practically throughout its range. The catches of this species reported in the FAO Yearbook of Fisheries Statistics amounted to 32 854 metric tons in 1987 and 33 903 metric tons in 1988, taken mainly by Cuba, Brazil, Bahamas, USA and Honduras. The species is mostly caught with traps, but also taken by hand, speared and trawled. It is marketed fresh; the tails are exported frozen or canned.

Local Names : ARUBA: Kreef; CURACAO: Kreef; CUBA: Langosta; FRANCE: Langouste d'Amérique, Langouste américaine, Langouste argus; MARTINIQUE: Homard blanc; MEXICO: Langosta del Golfo; USA: Spiny lobster, Bermuda spiny lobster, Common spiny lobster, Crawfish, Florida spiny lobster, West Indian langouste, West Indian spiny lobster.

Literature : Fischer (ed.), 1978: vol. 6; Williams, 1986: 19, figs 44, 79 b,c.

Panulirus cygnus George, 1962

Fig. 259

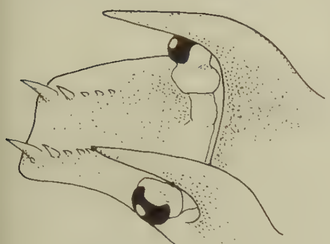
PALIN Panul 12

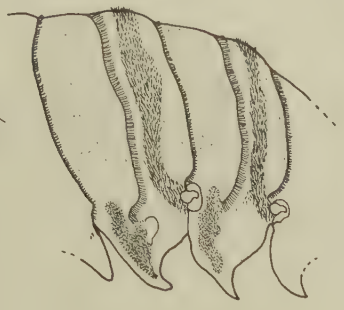
Panulirus cygnus George, 1962, Journal Royal Society Western Australia, 45(4): 100, text-figs 1-4, pls 1,2.

Synonyms: ***Panulirus longipes cygnus*** - Chittleborough & Thomas, 1969. In the older literature concerning Western Australian lobsters, the present species has often incorrectly been given the name ***Panulirus longipes*** (A. Milne Edwards).

FAO Names : **En** - Australian spiny lobster; **Fr** Langouste d'Australie; **Sp** - Langosta de Australia.

Type : Type locality: "Radar Reef, Rottnest Island, Western Australia (32°00'S 115°30'E), in reef pool at depth of 1 metre". Holotype male in WAM, no. 90-62.


antennular plate


abdominal somites (lateral view)

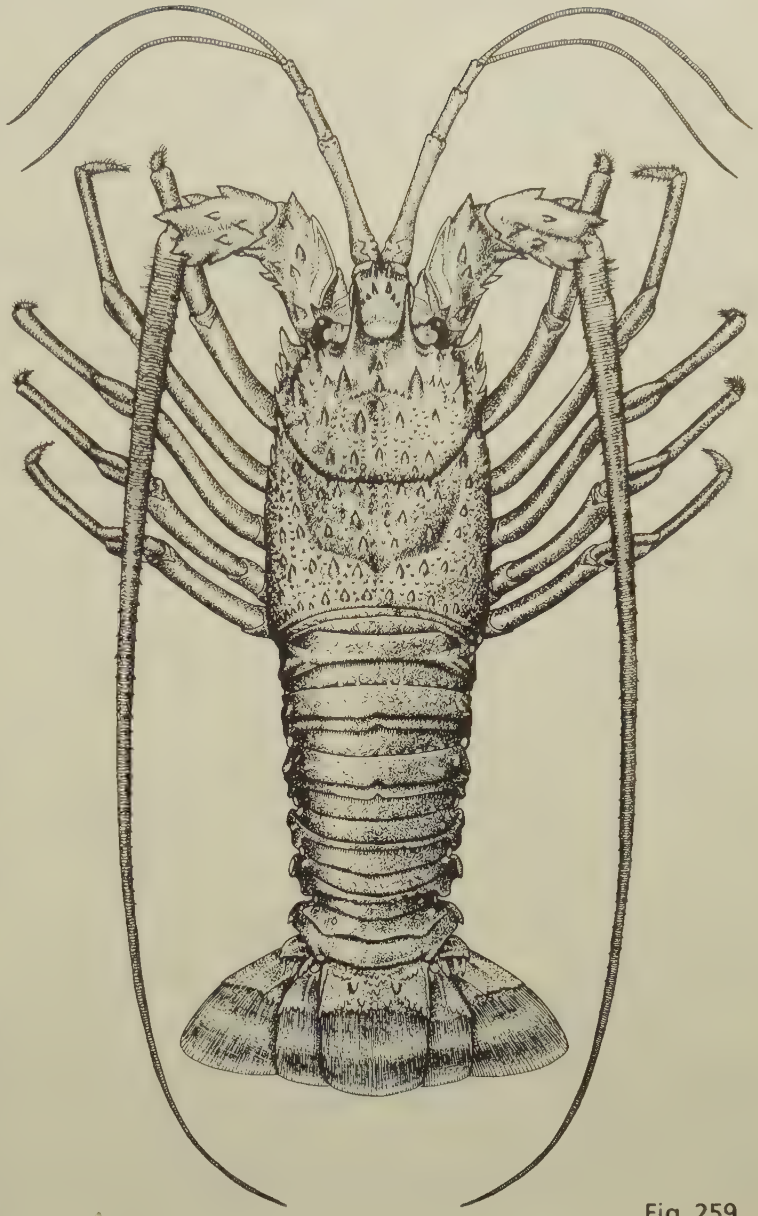


Fig. 259

Geographical Distribution : Indo-West Pacific region: restricted to Western Australia, namely on the west coast between Northwest Cape (21°48'S) and Hamelin Harbour (34°30'S) and at the offshore islands (Fig. 260).

Habitat and Biology : Found in depths between 0 and 90 m, rarely as deep as 120 m. The animals are nocturnal and shelter in the daytime in rock crevices and among coral. They undertake limited migrations. The species is omnivorous.

Size : Maximum carapace length 14 cm, corresponding to a total body length of about 40 cm. Average between 8 and 10 cm carapace length. The carapace length of ovigerous females or those with spermatophores is 9 to 11 cm.

Interest to Fisheries : The fishery of this species is of major importance in Australia. According to FAO Yearbook of Fisheries Statistics the annual catches were 11 025 metric tons in 1987 and in 1988. The season used to extend from 15 November to 14 August, but was reduced in 1978 from 15 November to 30 June. At the beginning of the season (November and December) the fishery takes the freshly moulted animals (the so-called "whites") which then leave the shallow reef areas. During the remaining part of the season, the "coastal red" lobsters are fished. The Abrolhos Islands are exceptional as the season starts there on 15 March. The fishing activities are concentrated between 24° and 35°S, and the largest yields are obtained between 28° and 32°S.

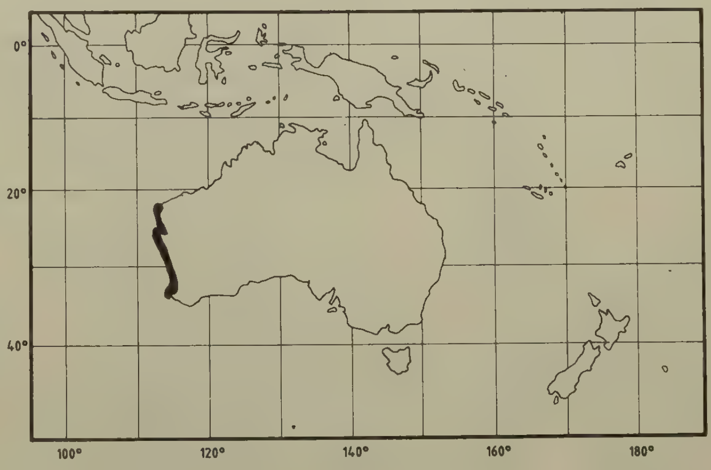


Fig. 260

The fishery operates lobster traps of various design and divers take specimens by hand. Apart from the closed season there are several protective measures: a minimum size limit (cl. 7.5 cm), bag limit for sports fishermen, restriction of the size of the lobster pots, etc.

The species is marketed fresh, but the greatest percentage is exported as frozen tails.

Local Names : AUSTRALIA: Western rock lobster (official name), Western Australian crayfish, Western cray.

Literature : Sheard, 1962; George & Holthuis, 1965:19, text-fig. 1d, pl. 4; Morgan & Barker, 1982-1987; Williams, 1986:18, figs 39, 78 k-l.

Panulirus echinatus Smith, 1869

Fig. 261

PALIN Panul 4

Panulirus echinatus S.I. Smith, 1869, Transactions Connecticut Academy Arts Sciences, 2:20, 39.

Synonyms: ? ***Panulirus inermis*** Pocock, 1891; ***Panulirus guttatus brasiliensis*** Faria & Silva, 1937.

FAO Names : **En** - Brown spiny lobster; **Fr** - Langouste brune; **Sp** - Langosta marrón.

Type : Type locality: of ***Panulirus echinatus***: "Pernambuco" (= Recife, Pernambuco State, Brazil). Whereabouts of type material unknown.

Type locality of ***Panulirus inermis***: "Dredged in Water Bay [Fernando do Noronha, Brazil]. About 10 fathoms depth". Holotype (puerulus stage) in BM, no. 1888:19, in alcohol, condition fair.

Type locality of ***Panulirus guttatus brasiliensis***: "Atóll das Roccas. - lattitude S.3°52'30" e longitude EM do Rio de Janeiro 9°20'26" - e Pernambuco". Whereabouts of type material unknown.

Geographical Distribution : Extreme N.E. Brazil (Ceará, Rio Grande do Norte, and Pernambuco States) and the Central Atlantic Islands (Canary Islands, Cape Verde Islands, St. Pauls Rocks, Fernando do Noronha, Atol das Rocas, Ilha da Trindade, Ascension, St. Helena) (Fig. 262).

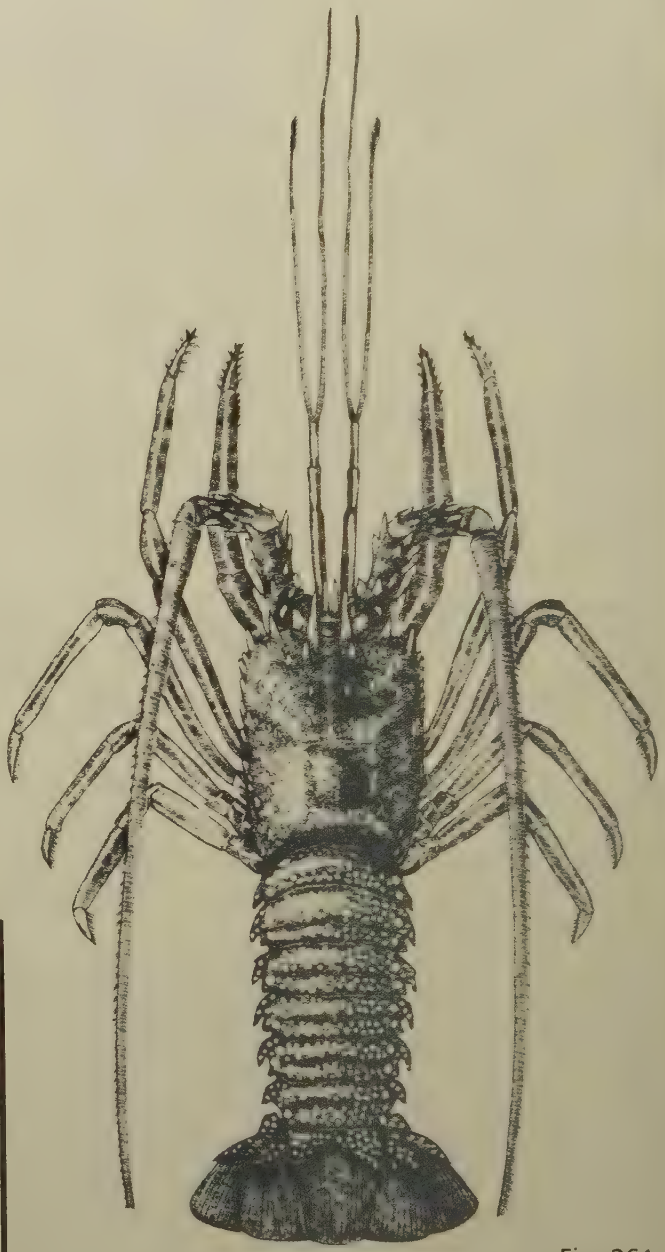


Fig. 261

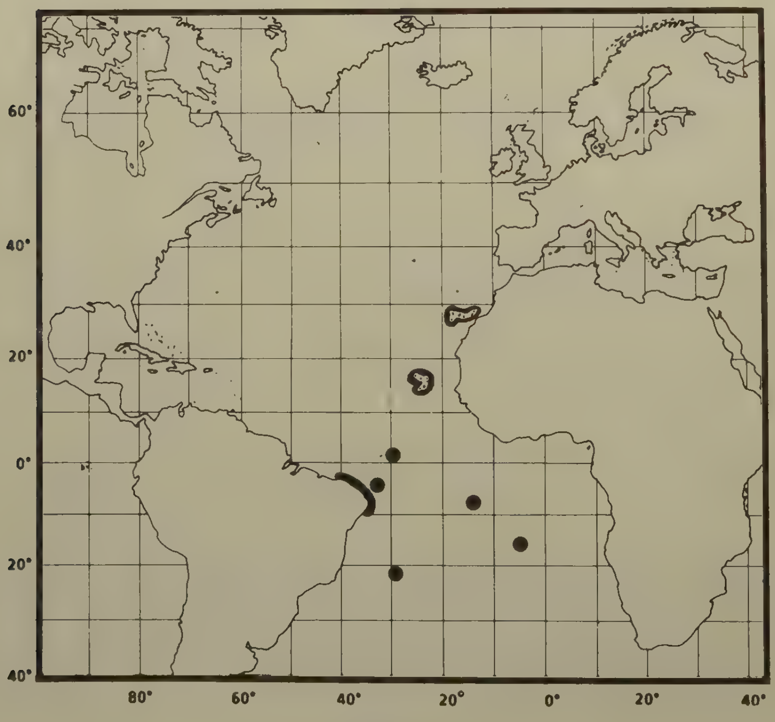


Fig. 262

Habitat and Biology : Depth range from 0 to 35 m, but usually not deeper than 25 m; in deep crevices in rocks, among boulders, etc. The animals are nocturnal.

Size : The carapace length varies from 3 to 19 cm (males) and 2 to 15 cm (females), the total body length from 7 to 39 cm (males) and 5 to 38 cm (females). Ovigerous females with carapace length 5 to 10 cm have been reported. In some areas the population consists of animals much smaller than in other areas.

Interest to Fisheries : The species is fished for throughout its range. In St. Helena it is reported to be of commercial importance. In the Cape Verde Islands it is the most abundant coastal lobster, and it might support a more intensive fishery. In Brazil it is fished and marketed in the states where it occurs, as well as at Fernando do Noronha and Atol das Rocas.

The species is caught with lobster traps, by diving and by hand (at night with torches in shallow water). In Brazil it is often taken together with ***Panulirus argus*** or ***P. laevicauda***.

Local Names : BRAZIL: Lagosta pintada, Lagosta encarnadinha, Lagosta roxa, Lagostinho, Potiquiquiya; CAPE VERDE ISLANDS: Lagosta vermelha; FRANCE: Langouste brune des Iles du Cap Vert; ST HELENA: Long legs.

Literature : Fischer, Bianchi & Scott (eds), 1981:vol. 5; Williams, 1986:20, fig. 47.

Panulirus gracilis Streets, 1871

Fig. 263

PALIN Panul 13

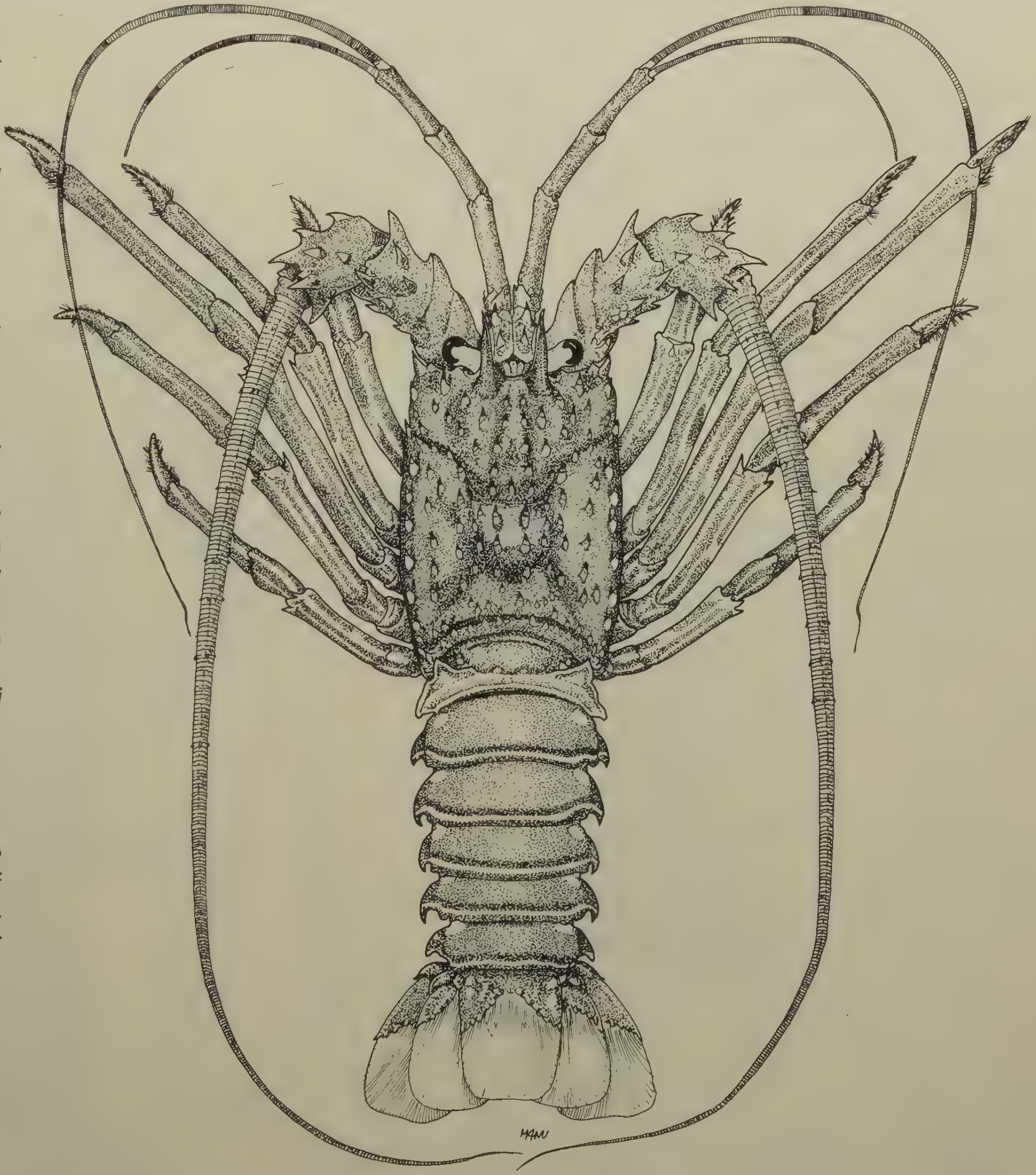
Panulirus gracilis Streets, 1871, Proceedings Academy Natural Sciences, Philadelphia, 1871: 225, pl 2, fig. 2.

FAO Names : **En** - Green spiny lobster; **Fr** - Langouste verte; **Sp** - Langosta barbona.

Type : Type locality of ***P. gracilis***: "Gulf of Tehuantepec, Mexico". Holotype in ANSP (not located in 1989).

Type locality of ***P. brevipes*** and ***P. paessleri***: "Mazatlan", Mexico. The male syntype specimen from this locality in ZMH, no. 8074, is chosen by Holthuis & Villalobos (1961: 265) as the lectotype of both ***Palinurus brevipes*** Pfeffer, 1881 and ***Palinurus paessleri*** Pfeffer, 1897.

Type locality of ***P. martensii***: "sulle coste Pacifiche del Darien" (= region of Golfo de San Miguel, Pacific coast of Panama; see E. Festa, 1909:12-53, map). Syntypes in MZT no.Cr.1185.



(combined after Holthuis & Villalobos, 1961, and Holthuis & Loesch, 1967)

Fig. 263

Geographical Distribution : Eastern Pacific from Baja California (Mexico) to Paita (Peru), and the Galápagos Islands (Fig. 264).

Habitat and Biology : Inhabits shallow coastal waters (0 to 18 m); among rocks and in cracks and crevices. The animals are nocturnal.

Size : Maximum total body length 32 cm (males) and 30 cm (females); carapace length 1 to 13 cm (males), and 1 to 12 cm (females).

Interest to Fisheries : The species is fished for commercially throughout its range and is sold in local markets. It is taken with trammel nets, by hand or with lobster pots.

Local Names : ECUADOR: Langosta verde; Blue lobster, Langosta azul (Galapagos Islands); MEXICO: Langosta verde, Langosta güera, Langosta de playa, Langosta caribe; PANAMA: Langosta barbona; PERU: Langosta verde.

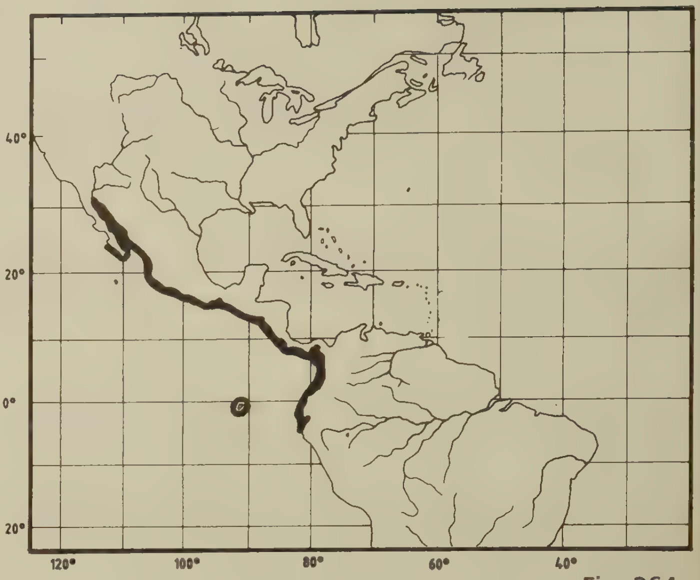


Fig. 264

Literature : Holthuis & Villalobos, 1961:252, figs; Holthuis & Loesch, 1967:220, pl. 9; Williams, 1986:24, figs 56, 80 e-f.

Panulirus guttatus (Latreille, 1804)

Fig. 265

PALIN Panul 2

Palinurus guttatus Latreille, 1804, Annales Muséum Histoire Naturelle, Paris, 3:392.

Synonyms: ***Palinurus (Senex) guttatus*** - Pfeffer, 1881.

FAO Names : En - Spotted spiny lobster; **Fr** - Langouste tachetée; **Sp** - Langosta moteada.

Type : Type locality: "dans les mers des Grandes-Indes". Through the lectotype selection by Holthuis (1959:126) the type locality is restricted to Suriname. Whereabouts of lectotype unknown. In MP are two dry specimens of this species (nos. Pa 440 and Pa 441) in a reasonable condition, labelled "Antilles", which may be syntypes.

Geographical Distribution : Western Atlantic: Bermuda, Bahamas, South Florida, Belize, Panama, Caribbean Arc from Cuba to Trinidad, Curaçao, Bonaire, Los Roques, Suriname. (Fig. 266).

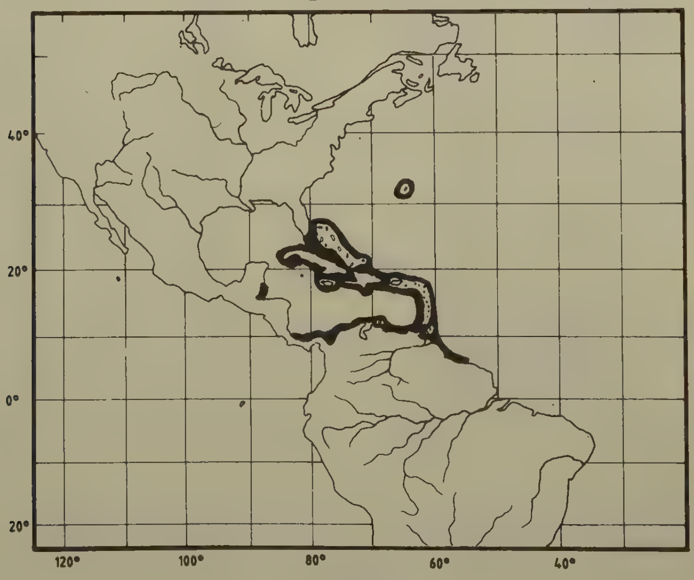


Fig. 266

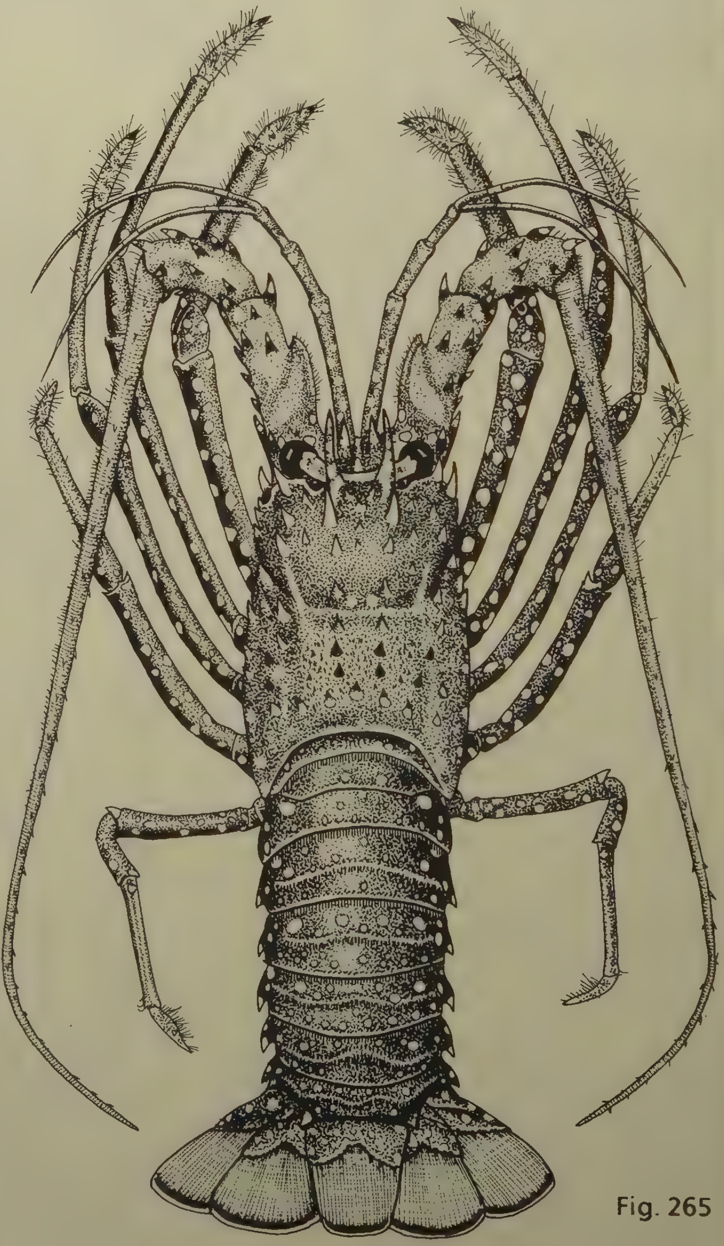


Fig. 265

Habitat and Biology : A shallow water species, inhabiting rocky areas, mainly in crevices.

Size : Maximum total body length about 20 cm, commonly to 15 cm

Interest to Fisheries : The species is taken throughout its range, but rather incidentally; there is no special fishery for it. It is taken by hand or speared and occasionally caught in traps, mostly those set for other species. Marketed fresh and mostly used for local consumption.

Local Names : BERMUDA: Guinea chick lobster, Star lobster, Spotted spiny lobster; CUBA: Langosta manchada, Langosta verde; MARTINIQUE: Homard bissie, Homard brésilien; NETHERLANDS ANTILLES: Kreef spanjo, Kreef indjan (Curaçao, Papiamentu language), Spanish lobster (St. Martin), Sand lobster (St. Eustatius); USA: Spotted lobster, Guinea lobster, Rock lobster, Spotted crawfish, Spotted spiny lobster.

Literature : Fischer (ed), 1978:vol. 6; Williams, 1986:19, figs 43, 78o, 79a.

Panulirus homarus (Linnaeus, 1758)

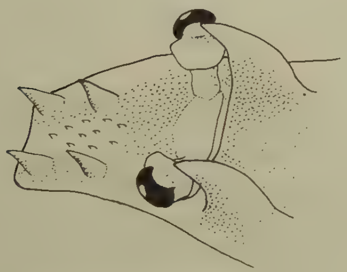
Fig. 267

PALIN Panul 6

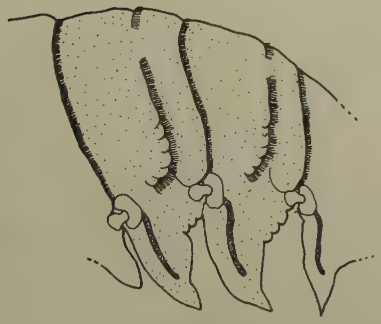
Cancer homarus Linnaeus, 1758, Systema Naturae, (ed. 10)1:633.

Synonyms: ***Astacus homarus*** - Fabricius, 1775; ***Palinurus homarus*** - Fabricius, 1798; ***Palinurus dasypus*** H. Milne Edwards, 1837; ? ***Palinurus spinosus*** H. Milne Edwards, 1837; ***Palinurus burgeri*** De Haan, 1841; ***Palinurus (Senex) buergeri*** - Pfeffer, 1881; ***Senex dasypus*** - Ortmann, 1891; ***Panulirus dasypus*** - Henderson, 1893; ***Panulirus buergeri*** - Ortmann, 1897; ***Panulirus burgeri megasculpta*** Pesta, 1915; ***Panulirus homarus rubellus*** Berrry, 1974.

FAO Names : **En** - Scalloped spiny lobster; **Fr** - Langouste festonnée ; **Sp** - Langosta festoneada.



antennular plate



abdominal somites
(lateral view)

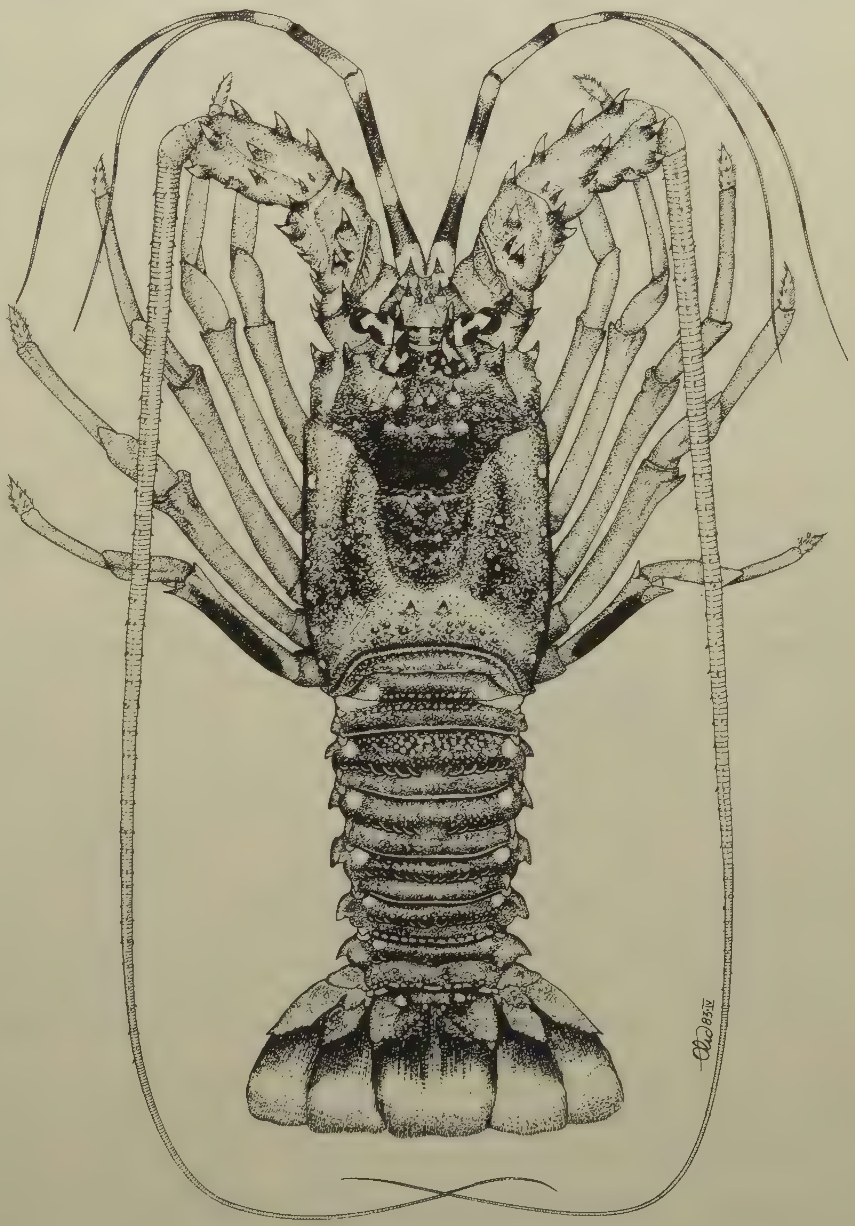


Fig. 267

Type : Type locality of ***Cancer homarus***: "Habitat in Mari Asiatico". Lectotype is the specimen figured by Rumphius (1705, Amboinsche Rariteitkamer: pl. 1 fig. A). The figure was drawn in Holland, as Rumphius had not provided an illustration himself. As noted in Rumphius' book (1705:3) the figure was prepared after a specimen in the collection of Henricus d'Acquet, then burgomaster of Delft. The specimen is now lost, but d'Acquet's collection of water colours of this material is still extant and held by the Koninklijk Instituut voor de Tropen (Royal Institute for the Tropics, formerly Colonial Institute) in Amsterdam. The figure of the lectotype of ***Cancer homarus*** has the following legend "9: Augusti 1698: Astacus Maximus Ambonensis egregie coloratus". The type locality of ***Cancer homarus*** thus definitely is Amboina, Moluccas, Indonesia.

Type locality of ***Palinurus dasypus***: "Habite les mers de l'Inde". Type material in MP, no longer extant (not located in 1989).

Type locality of ***Palinurus burgeri***: Japan, probably Nagasaki area. Holotype male in RMNH, no. D 21129.

Type locality of ***Panulirus burgeri megasculpta***: "Gischin (= Kischin) an der Südküste Arabiens" (= Qishn, South Yemen), 5 male, 2 female syntypes in NMW.

Type locality of ***Panulirus homarus rubellus***: South Africa (Natal and Zululand), S. Mozambique and S.E. Madagascar. Syntypes in SAM, in RMNH, no. D 29843 (in alcohol, condition good), and in BM, no. 1928.12.1.326 and 1925.8.18.86-87 (in alcohol, condition fair).

Geographical Distribution : Indo-West Pacific region: East Africa to Japan, Indonesia, Australia, New Caledonia and probably the Marquesas Archipelago (Fig. 268). The nominotypical form (***Panulirus h. homarus***) is found throughout the range of the species; ***P. homarus megasculpta*** is only known from the northern Arabian Sea (Socotra, south coast of Arabia, perhaps west coast of India); ***P. h. rubellus*** inhabits S.E. Africa (Mozambique to Natal) and S.E. Madagascar.

Habitat and Biology : Inhabits shallow waters between 1 and 90 m depth, mostly between 1 and 5 m; among rocks, often in the surf zone, sometimes in somewhat turbid water. The species is gregarious and nocturnal.

Size : Maximum total body length 31 cm, carapace length 12 cm. Average total body length 20 to 25 cm.

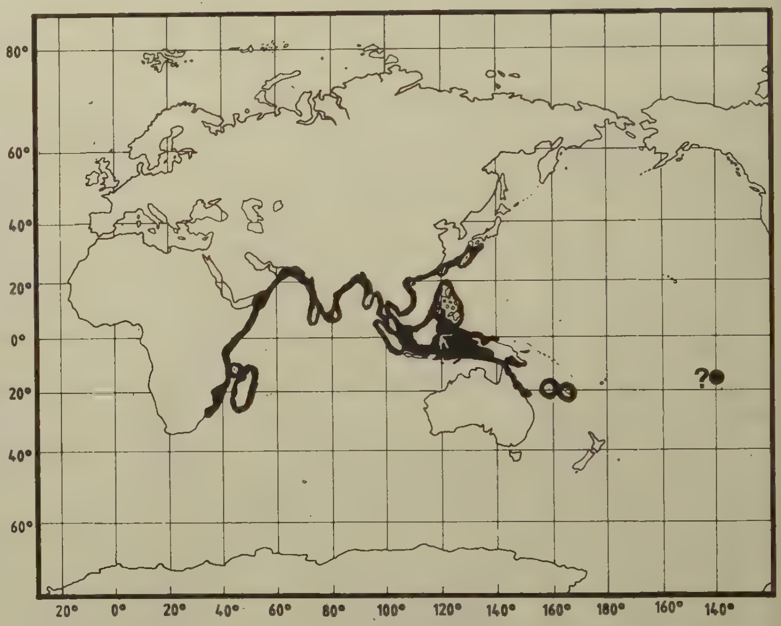


Fig. 268

Interest to Fisheries : In South Africa, until 1965 the exploitation of this species was "restricted to the efforts of Bantu children in the intertidal zone, and of divers in somewhat deeper waters" (Heydorn, 1969:1). In 1969, a company was formed for the exploitation of the species on a commercial basis. Although off the S.E. African coast (Natal) ***P. homarus*** is the most frequent of the ***Panulirus*** species, on the East African coast (Zanzibar, Kenya) it belongs to the less common lobsters. In S.E. Africa it is caught with baited lines, baited nets and traps . Off Somalia, the annual catch is about 120 tons. It is the most important contributing species to the lobster fishery off the Indian S.W. and S. coast (Kerala and Tamil Nadu), it is caught there with anchor hooks, traps and gill nets, and supports a lucrative freezing industry (Jones, 1967:1339). Gruvel (1911:33,34) remarked that the species (evidently ssp. ***rubellus***) "se prête .. à une exploitation industrielle intéressante" in S.E. Madagascar. In the Philippines the species "is abundantly caught by gill nets particularly after heavy rains" (Motoh, 1980:50,51). In Taiwan the species is common in the markets from spring to autumn (Chang, 1964:6, fig. 4; 1965:36,37). Also in Thailand the species is offered for sale in markets especially in the southern area. However, the fishery is mostly local, and the animals are marketed fresh or cooked, in some areas there is a minor export of frozen tails. In most places the species is caught by hand, with traps, gill nets, cast nets, baited lines etc. In Thailand, mounted specimens often in fancy glass cases, are sold to tourists (e.g. in Rayong).

Local Names : INDONESIA: Udang karang; JAPAN: Kebuka ise-ebi, Samehada ise-ebi; MOZAMBIQUE: Lagosta escamosa; PHILIPPINES: Banagan (also used for other species of the genus); THAILAND: Kung mangkon (also used for other species of the genus).

Literature : Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986:17, figs 38, 78j.

Remarks: A possible synonym of ***Panulirus homarus*** is ***Palinurus spinosus*** H. Milne Edwards, 1837. That species was described as having 4 teeth on the antennular plate, a transverse groove on each abdominal somite as ***P. guttatus***, 3 or 4 denticles on the posterior margin of the abdominal pleura, the abdomen with numerous small specks and no distinct lines or spots on the legs. The morphological characters would fit ***P. homarus***, ***P. interruptus*** and ***P. regius***, but the colour characters are most like those of ***P. homarus***. For the time being ***P. spinosus*** is therefore regarded here as a probable synonym of the present species. The type material in MP is no longer extant (in 1989).

Panulirus inflatus (Bouvier, 1895)

Fig. 269

PALIN Panul 14

Palinurus inflatus Bouvier, 1895, Bulletin Museum Histoire Naturelle, Paris, 1:8.

Synonyms: ***Palinurus digueti*** Gruvel, 1911; a manuscript name cited by Gruvel, 1911, in the synonymy of ***P. inflatus*** of which name it is an objective synonym.

FAO Names : En - Blue spiny lobster; **Fr** - Langouste bleue; **Sp** - Langosta azul.

Type : Type locality of ***P. inflatus*** and ***P. digueti***: "Basse Californie" (= Baja California, Mexico). Type specimens in MP, no. Pa 412 (27 cm long), Pa 446 (23 cm) both dry in rather good condition and labelled ***P. digueti***.

Geographical Distribution : Eastern Pacific region: west coast of Mexico from Baja California to Puerto Angel (Oaxaca) (Fig. 270); a record from San Diego, California, USA, needs verification.

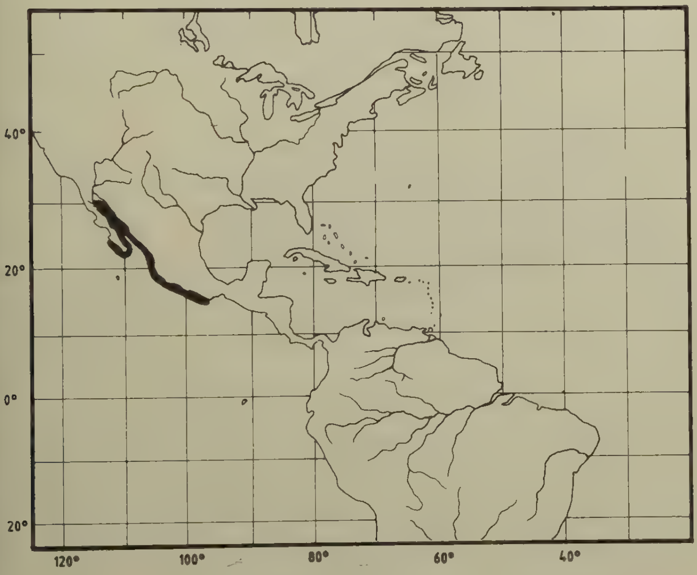


Fig. 270

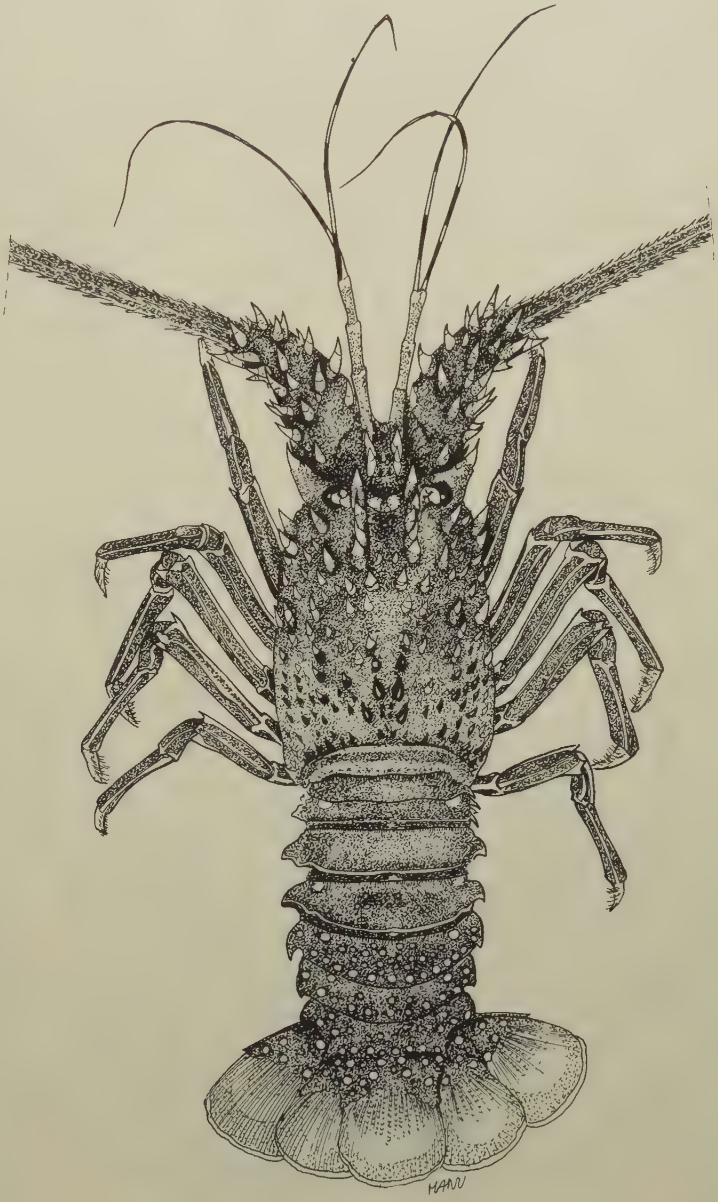


Fig. 269

Habitat and Biology : Sublittoral to 30 m deep; on rocky, rarely gravelly bottom.

Size : Maximum carapace length 15.5 cm, but usually not more than 12 cm; the corresponding total body lengths are respectively 38 and 30 cm.

Interest to Fisheries : The species is of interest to fishery throughout its range, although mostly used for local consumption. It is caught by hand and with gill nets, and sold fresh or frozen.

Local Names : MEXICO: Langosta azul, Langosta caribe, Langosta cabezona, Langosta de roca, Langosta prieta; USA: Pinto lobster, Blue spiny lobster.

Literature : Holthuis & Villalobos, 1961:251-276; Williams, 1986:22, figs 53, 80a-b.

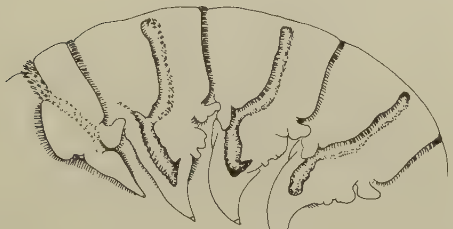
Panulirus interruptus (Randall, 1840)

PALIN Panul 15

Palinurus interruptus Randall, 1840, Journal Academy Natural Sciences, Philadelphia, 8:137

FAO Names : **En** - California spiny lobster; **Fr** - Langouste mexicaine; **Sp** - Langosta mexicana.

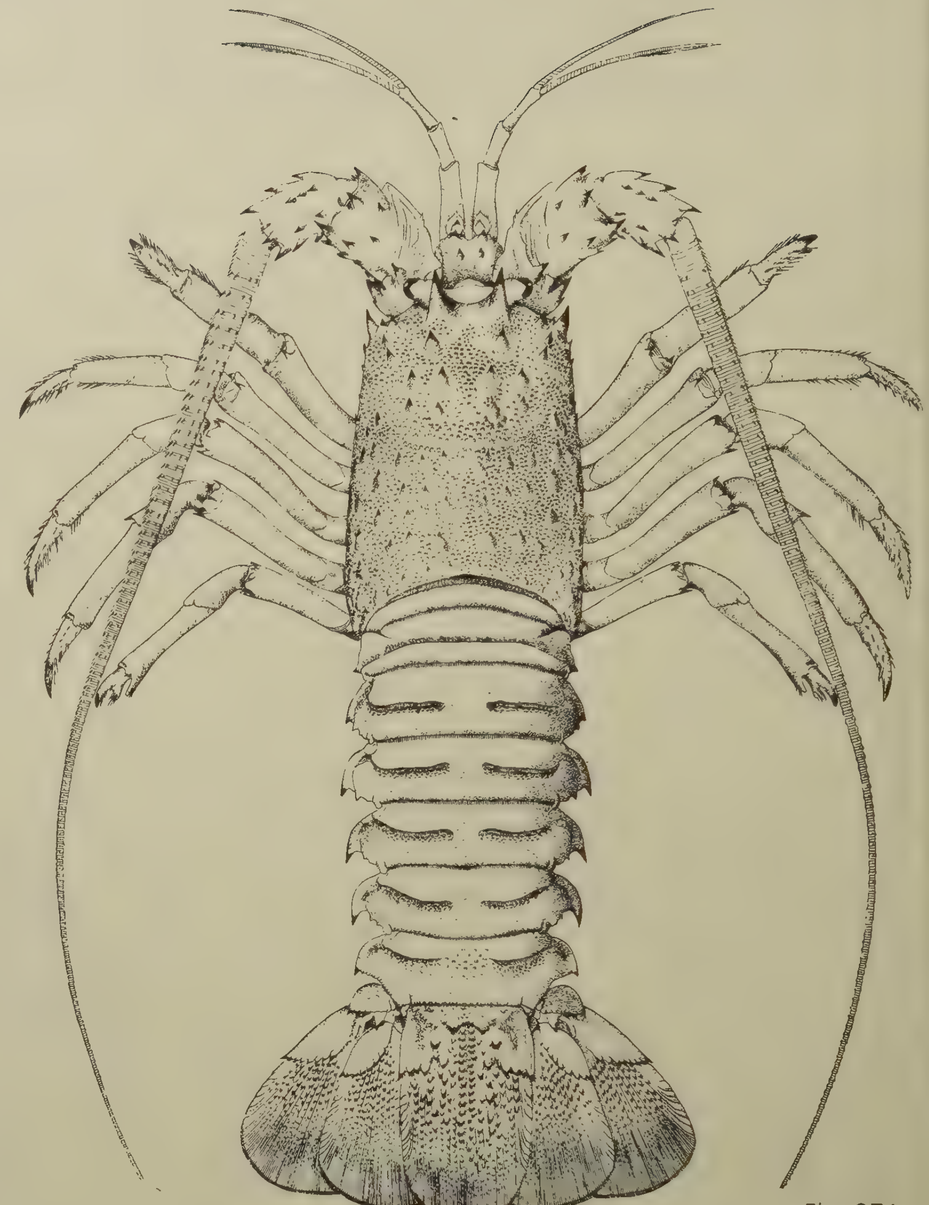
Type : Type locality: "from Upper California, where it is used as food by the natives". T. Nuttall, who collected the type material visited Monterey, Santa Barbara, San Pedro and San Diego in California (March - May 1836); he was most active in Santa Barbara and San Diego, and one of these two localities in all probability is the true type locality. Two dry syntypes in ANSP, No. 4188 (condition poor to reasonable).



abdominal somites (lateral view)
(from Williams,1986)

Geographical Distribution : Eastern Pacific region: California, USA (from San Luis Obispo Bay southwards; there is a doubtful record from Monterey), to Baja California, Mexico (entire west coast); the species is also reported from the Gulf of California (Fig. 272).

Fig. 271



(from Rathbun, 1884)

Fig. 271

Habitat and Biology : From the littoral zone (tide pools) to depths of about 65 m, being more frequent in the deeper waters; on rocky substrates. The species is nocturnal; spawning takes place from May to August.

Size : The maximum total body length reported is 60 cm, usually it does not exceed 30 cm. The legal size limit is a carapace length of 3.25 inch (= 8 cm), corresponding to a total length of about 20 cm.

Interest to Fisheries : ***Panulirus interruptus*** is the economically most important lobster of the American west coast. In California it is taken almost exclusively with traps, also trammel nets are used, and occasionally they are obtained by trawling. The species is also taken by diving by sports fishermen; according to Frey (1971) "the sport catch .... may equal 50% of the commercial catch". The total catches in 1976 were about 135 tons. The major fishing area is the west coast of Baja California.

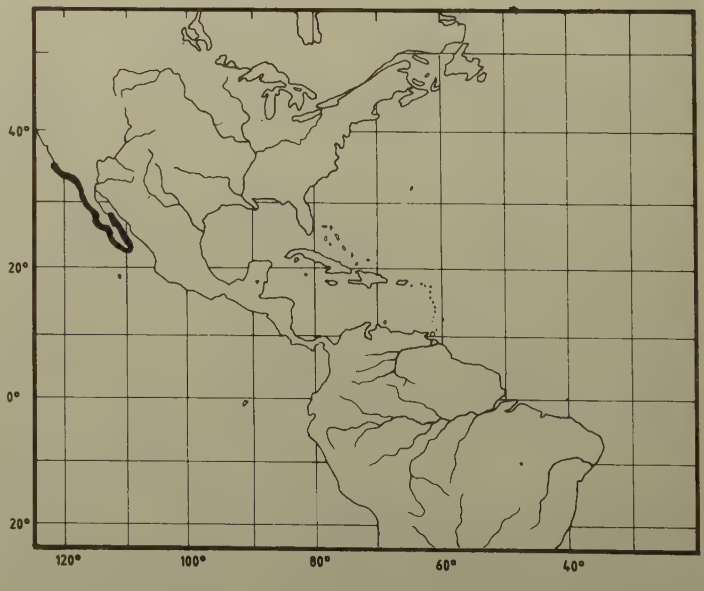


Fig. 272

The demand for the lobster in California "is so great that imports from Mexico average about twice the California catch" (Frey, 1971); of course the imported lobsters do not all need to be *P. interruptus*. Protective measures as to season, size, bag limit, etc. are at present in force. Sold fresh, cooked and frozen. Best known as gourmet food, sometimes used as bait.

Local Names: MEXICO: Langosta colorada, Langosta roja; USA: California lobster, California marine crayfish, California spiny lobster, Red lobster.

Literature: Mitchell et al., 1969:121-131; Frey, 1971:19; Williams, 1986:21, figs 49,79 h-i.

Panulirus japonicus (Von Siebold, 1824)

Fig. 273

PALIN Panul 16

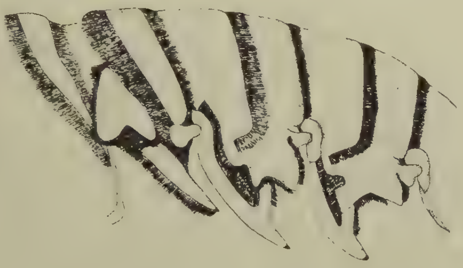
Palinurus japonicus Von Siebold, 1824, De Historiae naturalis in Japonia statu: 15. Name placed on the Official List of Specific Names in Zoology in Opinion 507 (published in 1958).

Synonyms: ***Senex japonicus*** - Ortmann, 1891; ***Puer pellucidus*** Ortmann, 1891; ***Puerulus pellucidus*** - Calman, 1909.

FAO Names: **En** - Japanese spiny lobster; **Fr** - Langouste japonaise; **Sp** - Langosta japonesa.

Type: Type locality of ***Palinurus japonicus***: "Japonia", Japan, probably near Nagasaki. Lectotype in RMNH, no. 60, selected by George & Holthuis, 1965:10, in alcohol condition excellent; paralectotypes in BM, MP, RMNH, USNM.

Type locality of ***Puer pellucidus***: "Japan, Kochi, 15-20 Faden" (= Kochi, Shikoku Island, Japan, 27-37 m). Two syntypes in MZS, preserved in alcohol, condition poor.



abdominal somites (lateral view)
(from George, & Holthuis, 1965)

Geographical Distribution: Western Pacific: Japan (south of 38°30'N to Ryukyu Islands), Korea, East China Sea, China, Xiamen (= Amoy), Taiwan (Fig. 274).

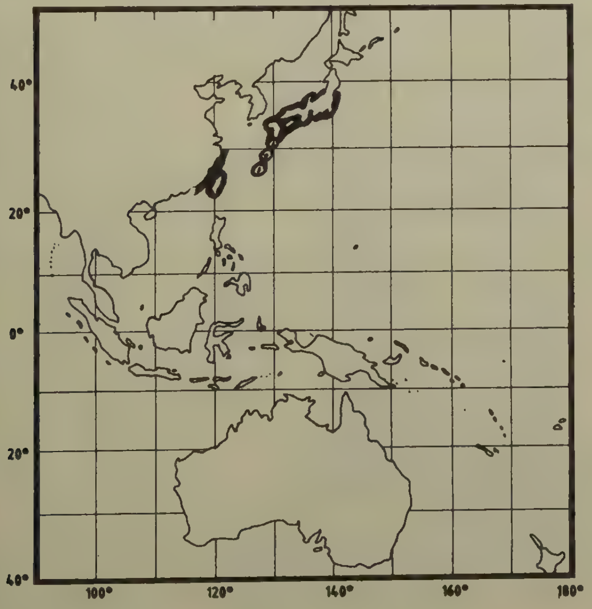
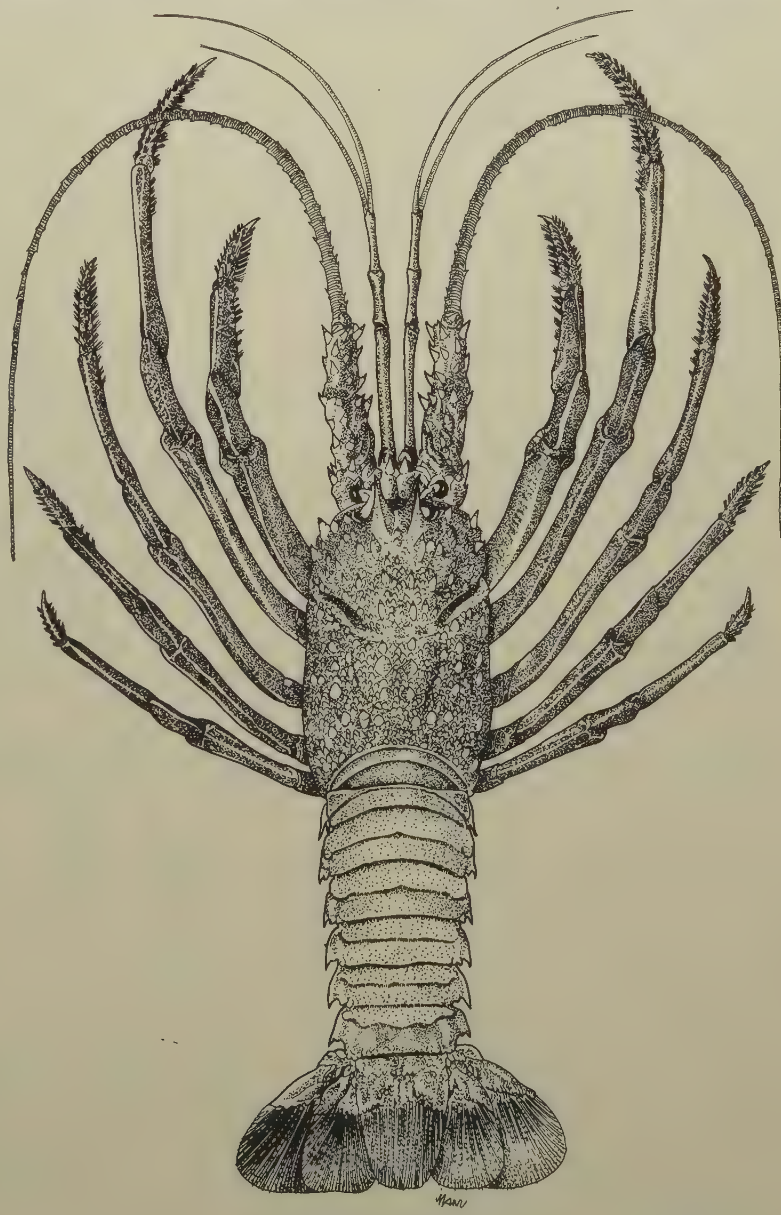


Fig. 274



(after George & Holthuis, 1965)

Fig. 273

Habitat and Biology : Inhabits shallow waters, between 1 and 15 m depth on rocky bottoms.

Size : Maximum total body length 30 cm; common length up to 25 cm.

Interest to Fisheries : ***Panulirus japonicus*** is fished for commercially in Japan. Longhurst (1970:286) reported the total annual catch of spiny lobsters in Japan to amount to 1 600 tons; by far the larger part of this is made up by the present species. The lobsters in Japan are sold fresh and frozen. The FAO Yearbook of Fishery Statistics reports for Japan no catches of ***P. japonicus***, but only for ***P. longipes***, viz. 1083 tons for 1987, 969 tons for 1988. However, as ***P. longipes*** is much less abundant than ***P. japonicus***, it is likely that these figures actually correspond to ***P. japonicus***, or to a combination of all Japanese spiny lobsters. In Taiwan, the species is found in markets throughout the year, but mostly so from March to October (Chang, 1965:41).

Local Names : JAPAN: Ise-ebi (official name), Japanese crayfish, No-ebi (for old specimens).

Literature : George & Holthuis, 1965:8-14, text-fig. 1a, pl. 1.

Panulirus laevicauda (Latreille, 1817)

Fig. 275

PALIN Panul 3

Palinurus laevicauda Latreille, 1817, Nouveau Dictionnaire d'Histoire naturelle, (ed. 2) 17:295.

Synonyms: ***Senex laevicauda*** - Von Ihering, 1897.

FAO Names : **En** - Smoothtail spiny lobster; **Fr** - Langouste indienne; **Sp** - Langosta verde.

Type : Type locality: "M. Delalande fils l'a trouvé sur les côtes du Bresil": Pierre Antoine Delalande (1787-1828) arrived from France in Rio de Janeiro, Brazil on 1 June 1816, "He returned to France after a short voyage through the Province of Rio de Janeiro, carrying the collections obtained" (Papavero, 1971, pp.115, 116). The type locality thus may be restricted to Rio de Janeiro, Brazil. Type material in MP; no longer extant in 1989.

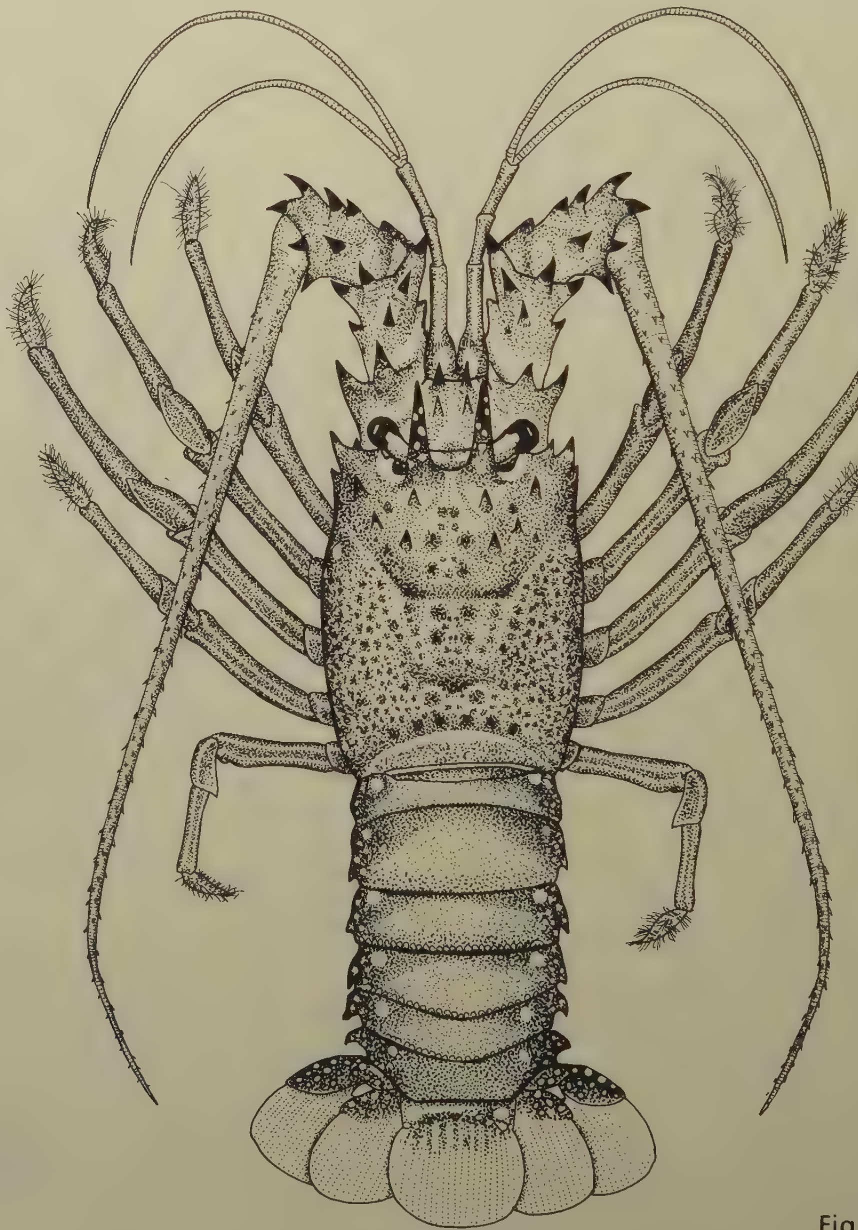


Fig. 275

Geographical Distribution : Western Atlantic: Bermuda and Florida to E. Brazil, including Yucatan and the Caribbean Sea (Fig. 276).

Habitat and Biology : Coastal waters, down to 50 m depth; substrate: rock or coral.

Size : Maximum total body length about 31 cm, common to 20 cm.

Interest to Fisheries : The species is caught throughout its range, but there is no special commercial fishery for it. Sometimes it is taken together with ***Panulirus argus***. The yield of its fishery seems to be largest in Brazil.

Local Names : BERMUDA: Smooth-tailed spiny lobster; BRAZIL: Lagosta cabo verde; MARTINIQUE: Grosses brésiliennes (for large specimens), Homard d'indien; USA: Brazilian lobster, Smooth-tailed crawfish.

Literature : Fischer (ed.), 1978: vol. 6; Williams, 1986:22, figs 52, 79 n-o.

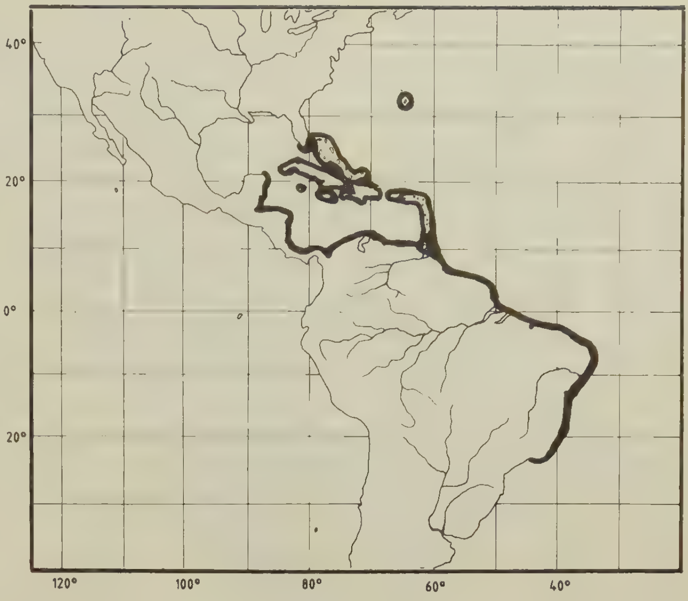


Fig. 276

Panulirus longipes (A. Milne Edwards, 1868)

Fig. 277

PALIN Panul 7

Palinurus longipes A. Milne Edwards, 1868, Nouvelles Archives Muséum Histoire Naturelle, Paris, 4:87, pl. 21.

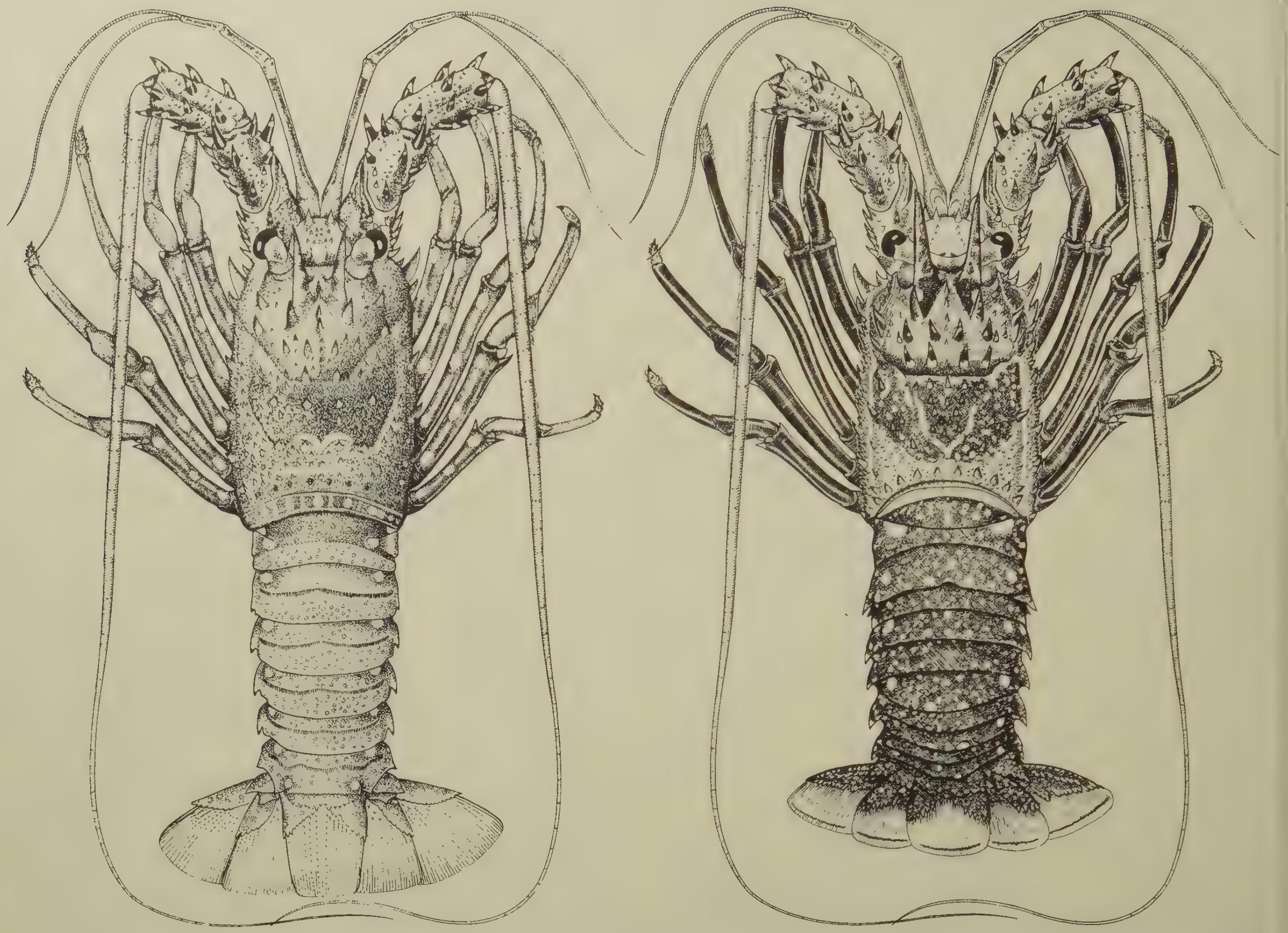
Synonyms: ***Palinurus femoristriga*** Von Martens, 1872; ***Palinurus longitarsus*** Lenz & Richters, 1881 (erroneous spelling of ***P. longipes***); ***Senex femoristriga*** - Ortmann, 1891; ***Panulirus bispinosus*** Borradaile, 1899; ***Panulirus japonicus longipes*** - De Man, 1916.

FAO Names : En - Longlegged spiny lobster; **Fr** - Langouste diablotin; **Sp** - Langosta duende.

Type : Type locality of ***P. longipes***: "trouvée sur les côtes de l'île Zanzibar", through the lectotype selection by George & Holthuis (1965:25); the paralectotype came from "Maurice" (= Mauritius). Type material in MP, no longer extant in 1989.

Type locality of ***P. femoristriga***: "Amboina", Moluccas, Indonesia. Holotype (or lectotype) female in ZMB, no. 1333, preserved in alcohol; could not be located in 1989.

Type locality of ***P. bispinosus***: "Sandal Bay, Lifu, Loyalty Islands". Holotype male, ZMC, in alcohol, condition good.



a. ***P. longipes longipes*** b. ***P. longipes femoristriga*** (after George & Holthuis, 1965) Fig. 277

Geographical Distribution : Indo-West Pacific region: East Africa to Japan and Polynesia. Two subspecies can be recognized: ***P. l. longipes*** (Fig. 277a) is the western form occurring from East Africa to Thailand, Taiwan, the Philippines and Indonesia and the eastern subspecies ***P.l. femoristriga*** (Fig. 277b) inhabiting Japan, the Moluccas, New Guinea, eastern Australia, New Caledonia and Polynesia (Fig. 278). Intermediate forms have been observed, especially in the area of overlap between the two ranges.

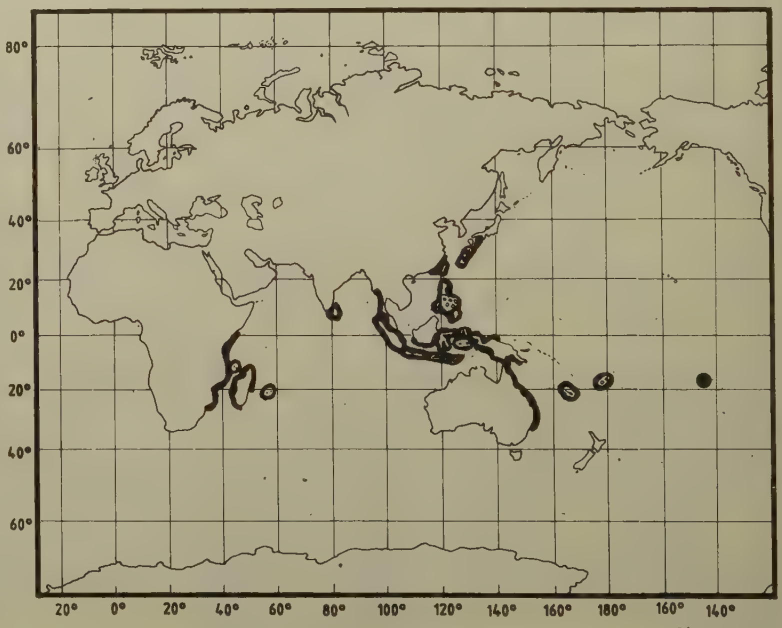


Fig. 278

Habitat and Biology : The species lives in clear or slightly turbid water at depths of 1 to 18 m (also reported from 122 m), in rocky areas and coral reefs. The animals are nocturnal and not gregarious.

Size : Maximum total body length 30 cm, average length 20 to 25 cm. Maximum carapace length 12 cm, average carapace length 8 to 10 cm. The smallest ovigerous female has a total length of 14 cm.

Interest to Fisheries : The species is caught throughout its range, mostly by hand when diving or with spears, also with traps, tangle nets and lobster pots. In Taiwan it is also known to be taken as by-catch by trawls. Fishing is of local interest only The animals are sold fresh in the markets and directly to restaurants. The FAO Yearbook of Fishery Statistics reports for this species catches in Japan of 1083 tons in 1987 and 969 tons in 1988. As ***P. longipes*** is not particularly common in Japan, and as ***P. japonicus*** was not listed in those statistics, it is likely that the figures refer to the latter species or to both.

Local Names : AUSTRALIA: Blue spot rock lobster, Coral crayfish, Painted crayfish, Red cray, Tropical rock lobster, Tropical spiny lobster; White whiskered rock lobster; JAPAN: Kanoko ise-ebi; MOZAMBIQUE: Lagosta de coral; NEW CALEDONIA: Langouste rouge; PHILIPPINES: Banagan (also used for other spiny lobster species), Coral crayfish, Marine crayfish, Marine rock lobster, Tropical rock lobster, Tropical spiny lobster; SOUTH AFRICA: Long-legged crayfish; THAILAND: Kung mangkon (also used for other species of spiny lobster); TUVALU: Oula.

Literature : George & Holthuis, 1965:21-28, text-fig. 1e, pl. 5, Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986:20, figs 46, 79 f-g.

Panulirus marginatus (Quoy & Gaimard, 1825)

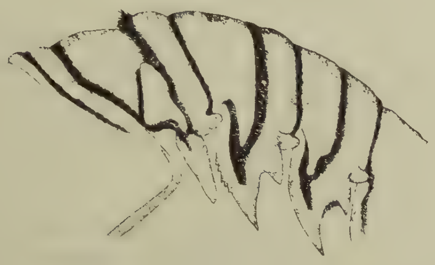
Fig. 279

PANUL Palin 17

Palinurus marginatus Quoy & Gaimard, 1825, in L. de Freycinet, Voyage autour du monde sur les corvettes l'Uranie et la Physicienne, Zool.:537, pl. 81.

FAO Names : **En** - Banded spiny lobster; **Fr** - Langouste bordée.

Type : Type locality: "Iles Sandwich" (= Hawaiian Islands). Type material no longer extant in MP in 1989.



abdominal somites (lateral view)
(from George & Holthuis, 1965)

Geographical Distribution : Only known from the Hawaiian Islands, including Pearl and Hermes Reef, and Laysan Island (Fig. 280).

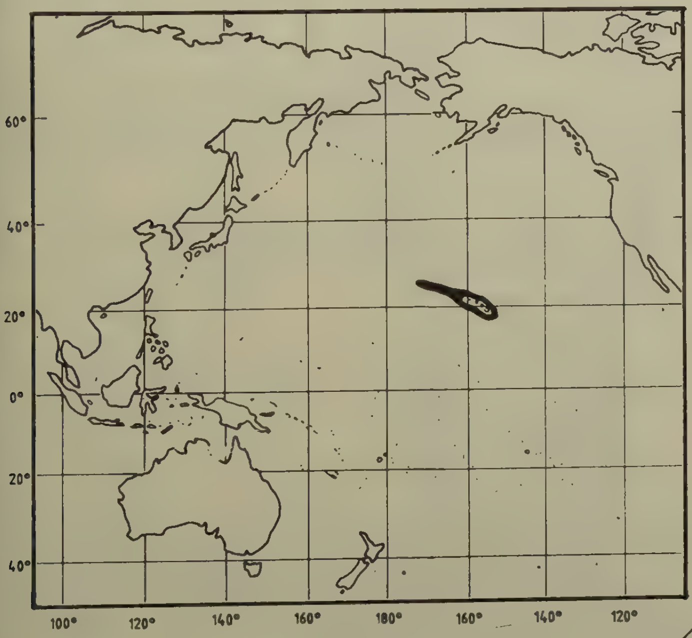
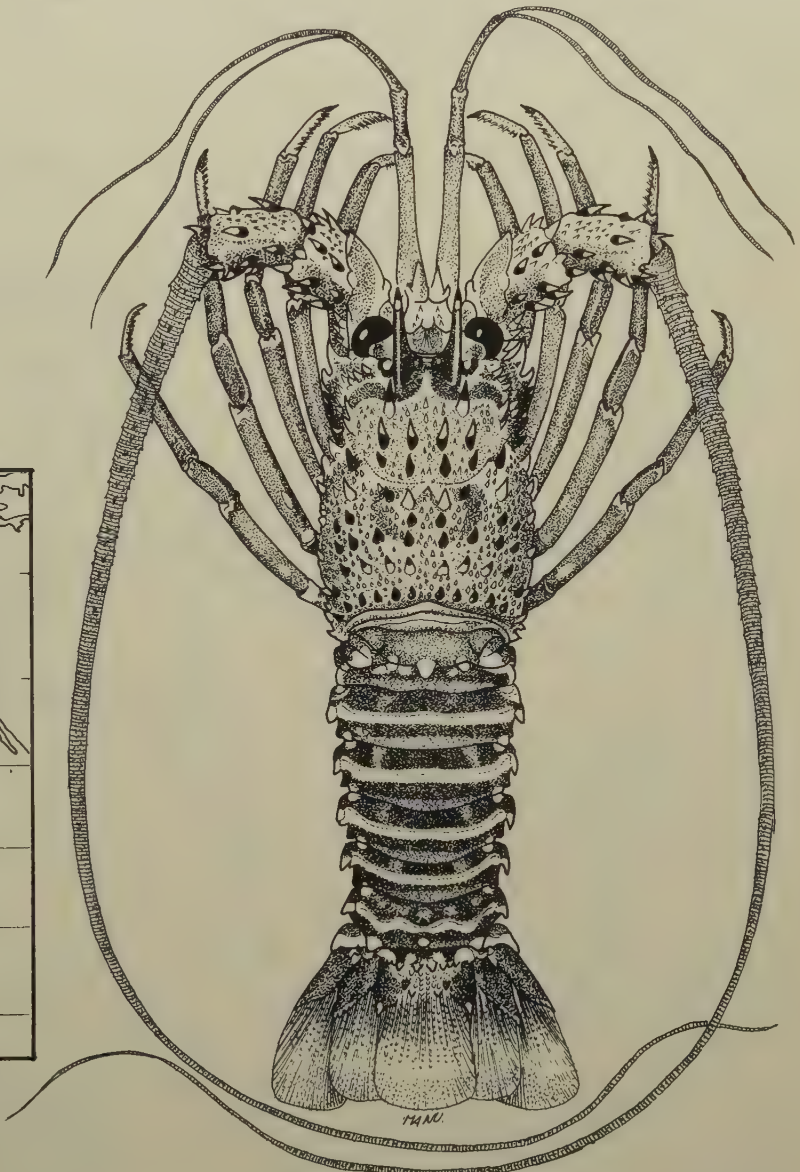


Fig. 280



(after George & Holthuis, 1965)

Fig. 279

Habitat and Biology : The species has been reported from depths down to 143 m, but usually in shallow water, in well protected places on a rocky substrate, under rocks and in rock crevices. The animals are nocturnal.

Size : Total body length to 40 cm, carapace length to 12 cm.

Interest to Fisheries : Used as food throughout its range. Fished with traps or nets. Also taken by hand, in daytime by diving, at night with lights and spears. Sold fresh in local markets. The 1971 USA fishery statistics indicate a total of 5 725 pounds (= 2 600 kg) of lobsters caught in the Hawaiian Islands, of which 5 371 pounds in Oahu, 263 pounds in Maui, 70 pounds in Hawaii and 21 pounds in Lanai. Of these slightly more were caught in gill nets (3 253 pounds) than in traps (2 113 pounds) and 339 pounds were registered as fished by hand. These figures include the catches of ***P. penicillatus***.

Local Names : HAWAII: Ula (general name for spiny lobsters).

Literature : George & Holthuis, 1965:14-17, text-fig. 1b, pl. 2; Williams, 1986:20, figs 45, 79 d-e.

Panulirus ornatus (Fabricius, 1798)

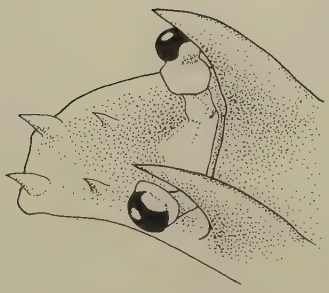
Fig. 281

PALIN Panul 8

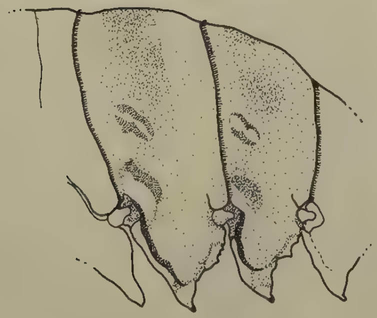
Palinurus ornatus Fabricius, 1798, Supplementum Entomologiae systematicae:400.

Synonyms: ***Palinurus sulcatus*** H. Milne Edwards, 1837; ***Panulirus sulcatus*** - White, 1847; ***Palinurus (Senex) sulcatus*** - Pfeffer, 1881; ***Senex ornatus*** - Lanchester, 1900.

FAO Names : **En** - Ornate spiny lobster; **Fr** - Langouste ornée; **Sp** - Langosta ornamentada.



antennular plate



abdominal somites (lateral view)

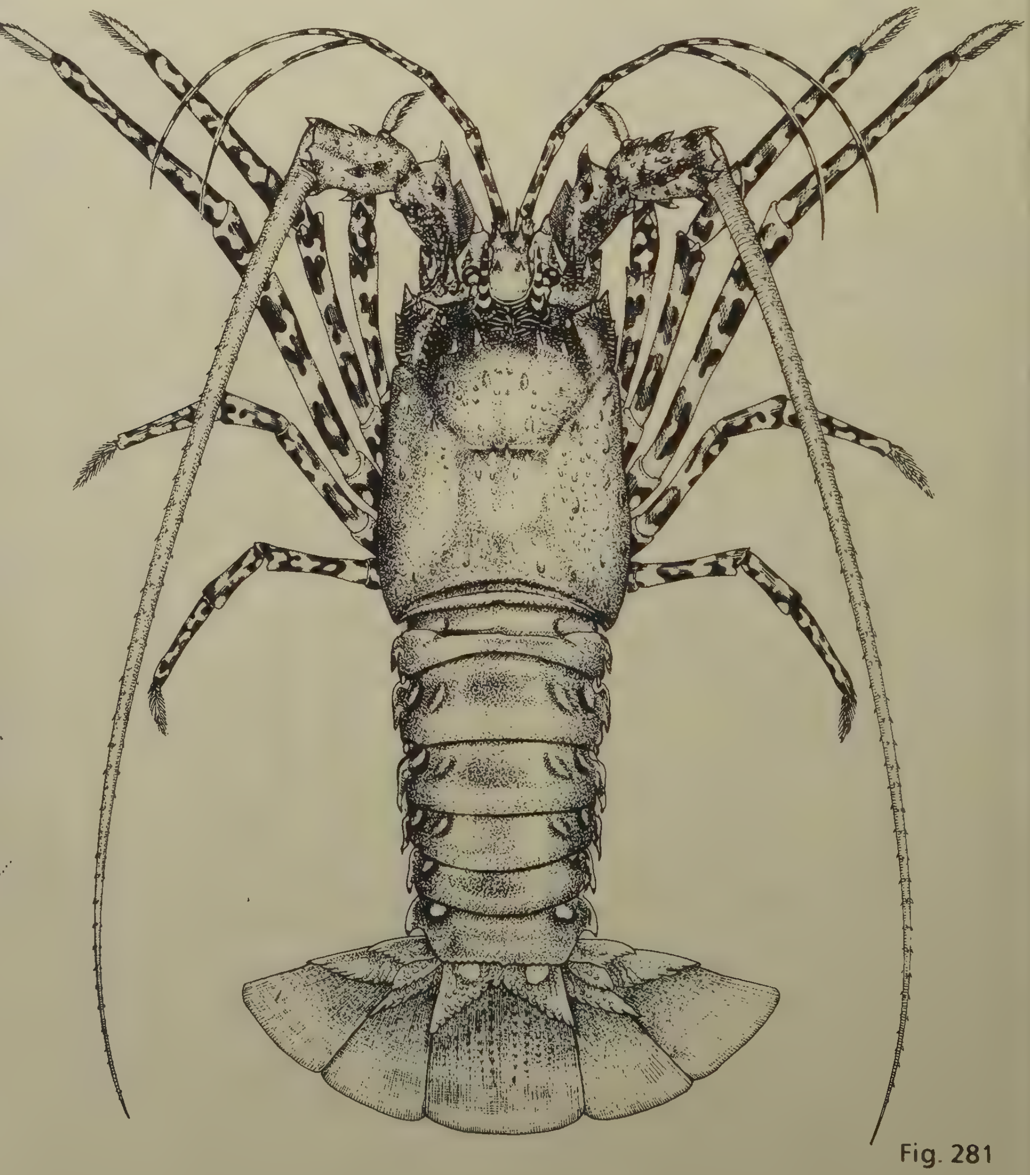


Fig. 281

Type : Type locality of ***P. ornatus***: "in Oceano Indico. Dom.Daldorff". I.K. Daldorff, a Danish officer, was stationed from 1790 to 1793 in Tranquebar, S.E. India (11°02'N, 79°51'E) in which area he collected; he did not return to India until 1798. His material is from Tranquebar or the nearby region, which may be considered the restricted type locality. Lectotype in UZM, originally preserved dry, recently transferred to alcohol, condition reasonable.

Type locality of ***P. sulcatus:*** "Habite les côtes de l'Inde". presumed type specimen in MP, no. Pa 448; a dry specimen in reasonable condition labelled "***Palinurus sulcatus*** Lmk. Indes".

Geographical Distribution : Indo-West Pacific region from the Red Sea and East Africa (south to Natal) to southern Japan, the Solomon Islands, Papua New Guinea, S.W., W., N., N.E. and E. Australia, New Caledonia and Fiji. Recently (1988) a specimen was found on the coast of Israel in the E. Mediterranean (Fig. 282).

Habitat and Biology : In shallow, sometimes slightly turbid coastal waters, from 1 to 8 m depth, with a few records from depths as great as 50 m. On sandy and muddy substrates, sometimes on rocky bottom, often near the mouths of rivers, but also on coral reefs. The species has been reported as solitary or as living in pairs, but has also been found in larger concentrations.

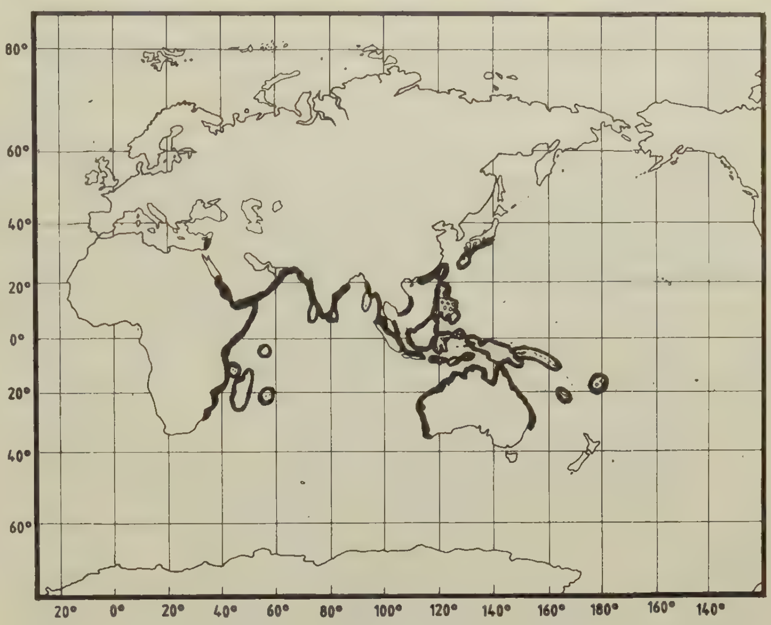


Fig. 282

Size : This is one of the largest of the ***Panulirus*** species and can attain a total body length of about 50 cm, but usually is much smaller (30 to 35 cm).

Interest to Fisheries : ***Panulirus ornatus*** is fished for throughout its range, but in most places only on a small scale. Taken mostly by hand by divers, or speared. Handnets are used also, but traps prove to be ineffective. Sold mostly fresh or frozen in local markets. In the Philippines a minor export activity has developed. In Australia a commercial fishery was developed since about 1966, it uses freezing installations ashore, as well as freezer boats; these operations cover the Torres Strait area, as well as N.E. Queensland, with an annual catch of over 120 tons tail weight around 1986 (Channells et al., 1987). Mounted dry specimens (sometimes in glass cases) are sold to tourists in several areas (e.g., in Thailand).

Local Names : AUSTRALIA: Coral crayfish, Ornate rock lobster, Painted cray, Tropical rock lobster; FIJI: Coral crayfish, Ornate rock lobster, Painted crayfish, Tropical rock lobster, Uraubola, Urautamata; JAPAN: Nishiki-ebi; MOZAMBIQUE: Lagosta ornamentada; NEW CALEDONIA: Grosse langouste porcelaine; PAKISTAN: Kikat (Sindhi), Kikka (Baluchi); PHILIPPINES: Banagan; SOUTH AFRICA: Ornate crayfish, Ornate spiny lobster; THAILAND: Kung mangkon.

Literature : Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986:22, figs 51, 79 l-m.

Panulirus pascuensis Reed, 1954

Fig. 283

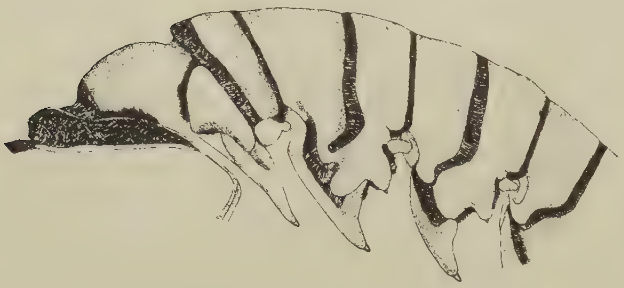
PALIN Panul 18

Panulirus pascuensis Reed, 1954, Scientia, Valparaiso, 21:121,136, figs 1-9.

Synonyms: ***Palinurus paschalis*** (Philippi Ms.) Holthuis, 1972.

FAO Names : **En** - Easter Island spiny lobster.

Type : Type locality of ***P. pascuensis***: "Isla de Pascua" (= Easter Island, southern Pacific). Holotype male in Museo de la Dirección General de Pesca y Caza de Chile, Valparaíso, Chile.



abdominal somites (lateral view)
(from George, & Holthuis, 1965)

Geographical Distribution : Easter Island and Pitcairn Island, southern Pacific Ocean (Fig. 284).

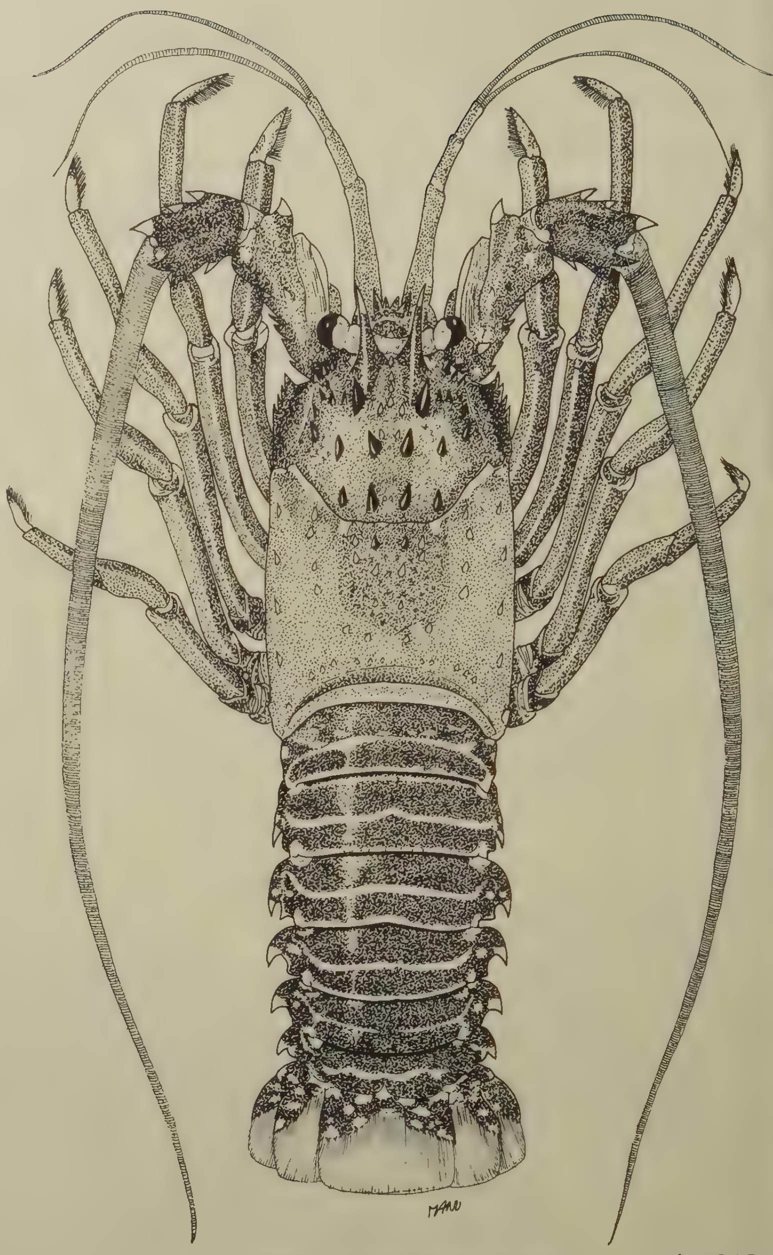
Habitat and Biology : Lives in shallow water (from 0 to 5 m depth) in crevices of a rocky substrate. Impregnated and ovigerous females have been taken in December.

Size : Reported carapace lengths of males 6 to 10 cm; females cl. 6 to 9.5 cm. This corresponds to total body lengths of about 15 to 25 cm (males), and 15 to 24 cm (females); the smallest ovigerous female has a cl. of 6 cm.

Interest to Fisheries : Both at Easter Island and at Pitcairn the species is mainly taken by hand or speared by divers in daytime, and with torch light at night; also gill nets and lobster pots are used. The lobsters are sold fresh for local consumption.

Local Names : CHILE: Langosta de Pascua, Ura (Easter Island).

Literature : George & Holthuis, 1965:17-19, text-fig. 1c; pl.3; Holthuis, 1972:36-44, figs 1,2.



(after George & Holthuis, 1965)

Fig. 283

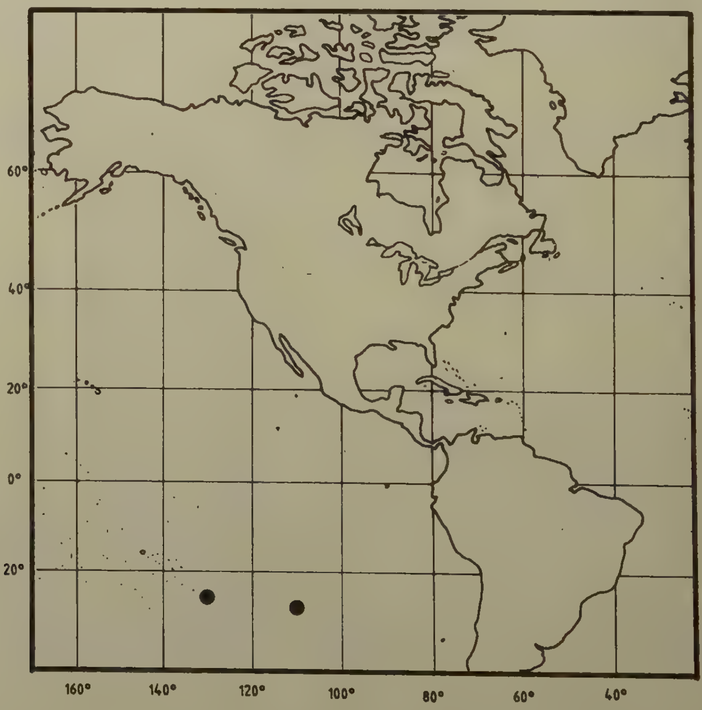


Fig. 284

Panulirus penicillatus (Olivier, 1791)

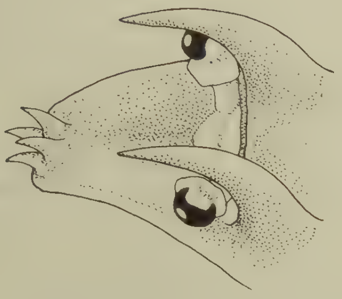
Fig. 285

PALIN Panul 9

Astacus penicillatus Olivier, 1791, Encyclopedie méthodique, Histoire naturelle, Insectes, 6:343.

Synonyms: ***Palinurus gigas*** Lamarck, 1801; ***Palinurus penicillatus*** - Olivier, 1811; ***Palinurus ehrenbergi*** Heller, 1861; ***Palinurus (Panulirus) ehrenbergi*** - Heller, 1865; ***Palinurus (Senex) penicillatus*** - Pfeffer, 1881; ***Cancer theresae*** Curtiss, 1938.

FAO Names : En - Pronghorn spiny lobster; **Fr** - Langouste fourchette; **Sp** - Langosta horquilla.



antennular plate

Type : Type locality of ***A. penicillatus*** (and ***P. gigas***, which is a replacement name for ***A. penicillatus***): unknown ("Elle se trouve .....").
Type material in Lamarck collection, in MP? In the Paris Museum there are 7 specimens of this species labelled "Mer des Indes", or without locality indication. One or more of these may belong to the type lot, but this cannot be made certain.

Type locality of ***P. ehrenbergi***: "Coseir" (= Quseir, Red Sea coast of Egypt). Type in NMW.

Type locality of ***Cancer theresae***: "At Tautira, in the barrier reef", Tahiti; whereabouts of type material unknown.

Geographical Distribution : Indo-West Pacific and Eastern Pacific regions: Red Sea, E. and S.E. Africa to Japan, Hawaii, Samoa and the Tuamotu Archipelago and further east to the islands off the west coast of America (Clipperton Island, Revillagigedo Archipelago, Cocos Island, Galapagos Archipelago) and in some localities near the continental coast of Mexico (Sinaloa, Nayarit and Guerrero) (Fig. 286).

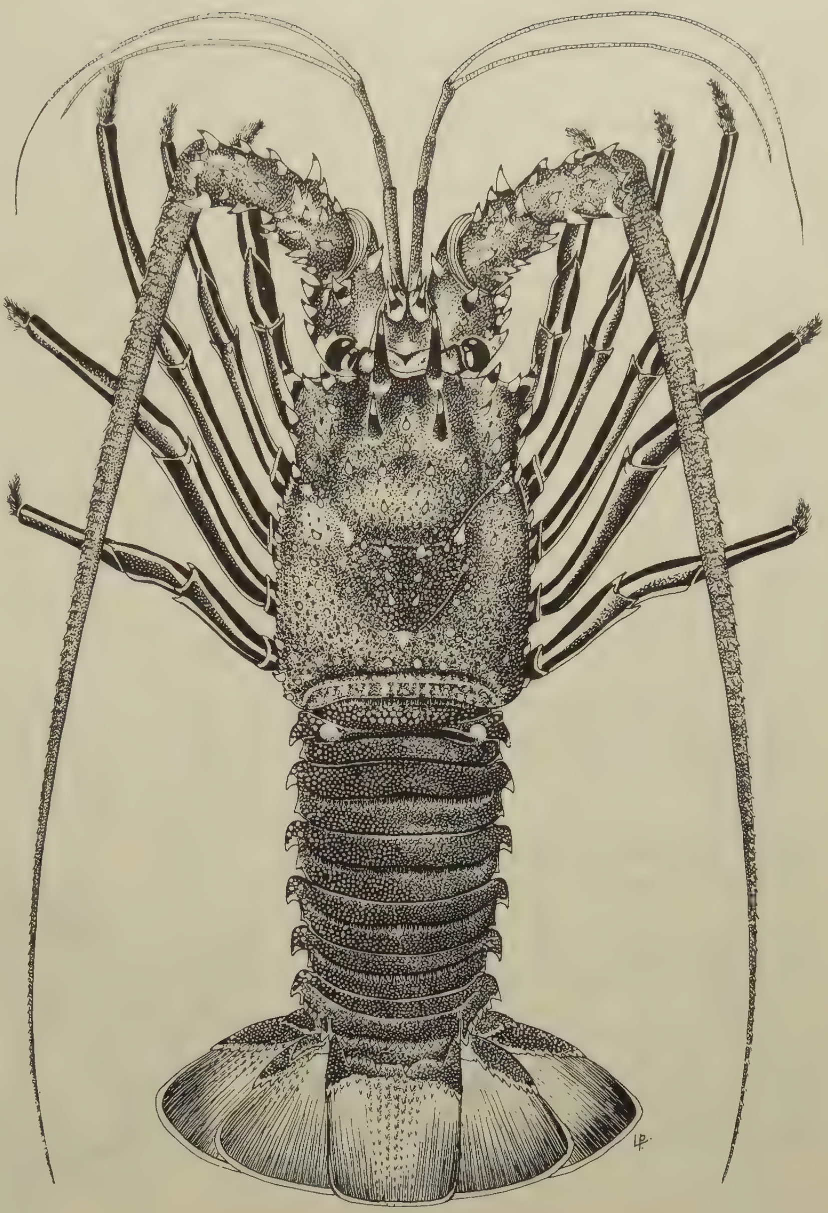


Fig. 285

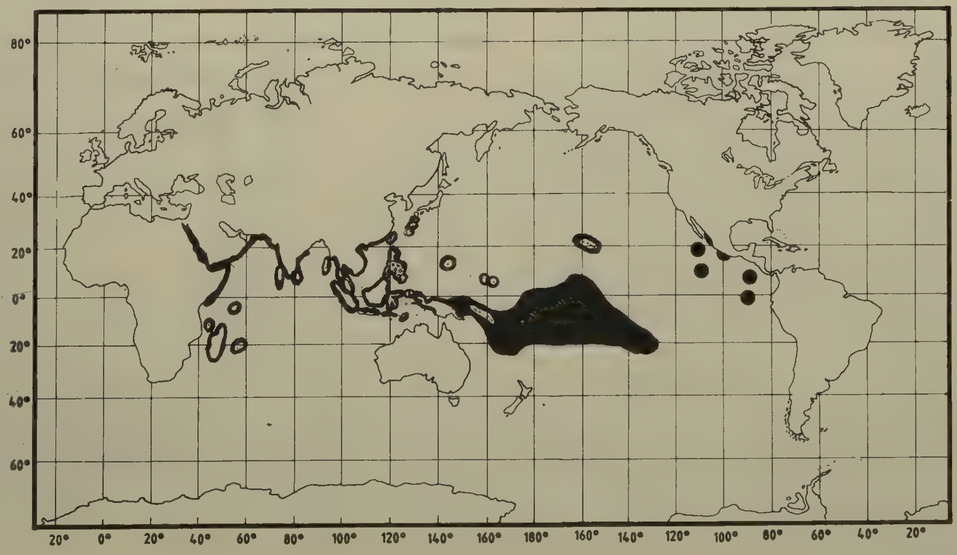


Fig. 286

Habitat and Biology : Depth range from 1 to 4 m, rocky substrates. In clear water, not influenced by rivers, often in surf zone and in surge channels. Therefore often near arid coasts and on small islands. The species is not gregarious and is nocturnal, hiding in the daytime in crevices in the rocks and coral reefs.

Size : Maximum total body length about 40 cm, average adult length about 30 cm. Males usually much larger than females.

Interest to Fisheries : The species is fished wherever it occurs. Mostly taken by hand or with spears during diving in daytime, or with torch light near the surface at night. Traps do not seem not to be very effective, but are used in places; trammel nets seem to give better results. On the west coast of Thailand the species is sold in local markets or directly to restaurants. In the Galapagos the average catch is 50 to 100 lobsters per day. They are sold fresh for local consumption or as frozen lobster tails.

Local Names : AUSTRALIA: Coral cray, Double spined rock lobster; FIJI: Golden rock lobster, Uraukula, Urauvatuvatu; GALAPAGOS ISLANDS: Langosta roja, Red lobster; HAWAII: Tufted spiny lobster, Ula; INDONESIA: Udang barong; JAPAN: Shima ise-ebi; MALAYSIA: Udang karang; MEXICO: Langosta de Isla Socorro; MOZAMBIQUE: Lagosta cornuda; NEW CALEDONIA: Grosses têtes (name used for large males), Vraie langouste verte; PALAU: Raiklius; PHILIPPINES: Banagan, Spiny lobster, Tufted spiny lobster; SOUTH AFRICA: Variegated crayfish; TAHITI: Oura-miti; THAILAND: Kung king kong (for large specimens, Phuket), Kung mangkon; TUAMOTU ISLANDS: Komanga; USA: Socorro spiny lobster; VIETNAM: Tôm hum.

Literature : Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986:18, figs 40, 78 m-n.

Panulirus polyphagus (Herbst, 1793)

Fig. 287

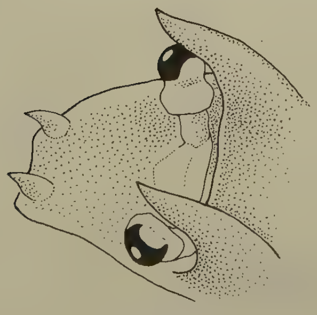
PALIN Panul 10

Cancer (Astacus) polyphagus Herbst, 1793, Versuch einer Naturgeschichte der Krabben und Krebse, 2:90, pl.32.

Synonyms: ***Palinurus fasciatus*** Fabricius, 1798; ***Palinurus polyphagus*** - Bosc, 1802; ***Panulirus orientalis*** Doflein, 1900.

FAO Names : En - Mud spiny lobster; **Fr** - Langouste de vase; **Sp** - Langosta fanguera.

Type : Type locality of ***Cancer polyphagus***: "Das Vaterland ist Ostindien". The dry holotype or lectotype in ZMB, no. 1973, in good condition.



antennular plate

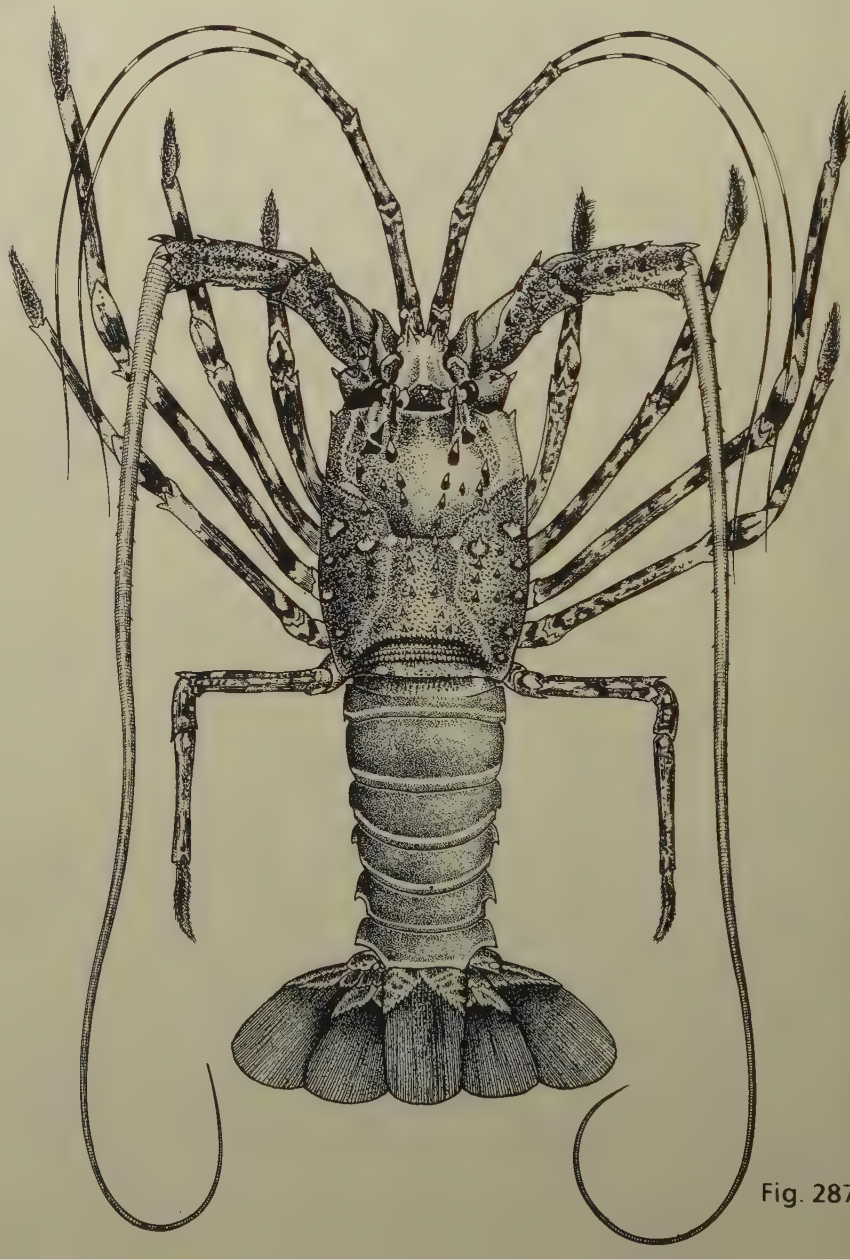


Fig. 287

Type locality of ***P. fasciatus***: "Habitat in Oceano Indico Dom. Daldorff". I.K. Daldorff, a Danish officer at Tranquebar, S.E. India, collected there for Fabricius and also Herbst obtained material from him. The type material of ***P. fasciatus*** almost certainly came from the Tranquebar area, and there even is a possibility that Herbst's material of ***C. polyphagus*** was also obtained from Daldorff, so that the type localities of the two species would be very close, but this is only a guess. Three syntypes of ***P. fasciatus*** are in UZM, preserved in alcohol, condition reasonable.

The statement of the type locality of ***P. orientalis*** is: "Japan. Salmin". Balss (1914:76), who examined Doflein's type specimen and synonymized ***P. orientalis*** with the present species, remarked that the locality indication "Japan" is doubtful "da auf Salmins Fundorte in unserer Sammlung kein Verlass ist" and as the species was not known from Japan. C.L. Salmin was a dealer in natural history objects in Hamburg in the second half of the last century (the Leiden Museum had dealings with him between 1863 and 1875) and evidently, like several of such dealers at that time, was not very accurate with labelling his material. The true type locality of ***P. orientalis*** thus is unknown; the holotype was in ZSM, now probably lost (not located in 1989).

Geographical Distribution : Indo-West Pacific region, from the coasts of Pakistan and India to Vietnam, the Philippines, Indonesia, N.W. Australia and the Gulf of Papua (Fig. 288).

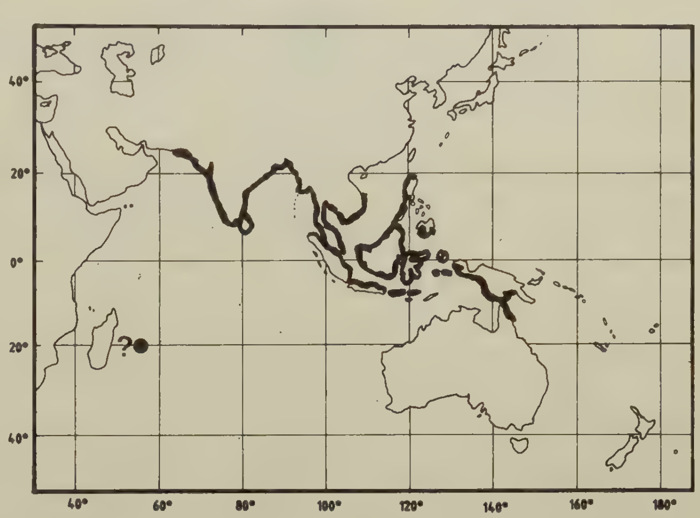


Fig. 288

Habitat and Biology : The species is found on muddy substrates and sometimes on rocky bottoms. Often found near river mouths, in turbid water. Depth range from 3 to 90 m, but usually far less than 40 m.

Size : Maximum total body length: about 40 cm, common from 20 to 25 cm.

Interest to Fisheries : In the Bay of Bengal and the Gulf of Thailand, the species is quite important commercially. In India, the main fishing season extends from November to March. The animals are caught by trawling, but also with set nets, seines, etc.; they rarely enter traps. Sold fresh and frozen in local markets and also transported to the larger towns. Served regularly in restaurants in Thailand, and else-where. In Thailand, mounted dry specimens, usually in fancy glass cases, are sold as curios to tourists.

Local Names : BURMA: Kyauk-pazun; INDONESIA: Udang barong; PAKISTAN: Kikat (Sindhi), Kikka (Baluchi); PHILIPPINES: Banag, Banagan; THAILAND: Kung mangkon; VIETNAM: Tôm hum.

Literature : Fischer & Bianchi (eds), 1984: vol. 5.

Remarks: As the specific name ***fasciatus*** formerly has often been used not for this species but for ***P. versicolor***, old records of ***P. fasciatus*** have to be treated with much reserve.

Panulirus regius De Brito Capello, 1864

Fig. 289

PALIN Panul 5

Panulirus regius De Brito Capello, 1864, Memorias Academia real sciencias Lisboa (classe sciencias matematicas, physicas e naturaes), (2)3:5, fig. 1.

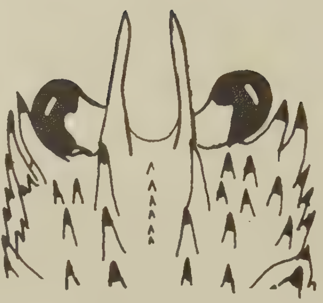
Synonyms: ***Phyllosoma commune*** Leach, 1817; ***Palinurus rissonii*** Desmarest, 1825; ***Palinurus (Senex) longipes*** Pfeffer, 1881 (non A. Milne Edwards, 1868); ***Palinustus phoberus*** De Rochebrune, 1883; ***Puer atlanticus*** Bouvier, 1905.

FAO Names : **En** - Royal spiny lobster; **Fr** - Langouste royale; **Sp** - Langosta real.

Type : Type locality of ***P. regius***: "Habita os mares das ilhas de Cabo-verde. Na ilha de S. Vicente d'este archipelago foi encontrado ...... o exemplar que nos serviu de typo" (= São Vicente, Cape Verde Archipelago). Holotype in MNL, Lisbon, Portugal, lost in the fire of 1978.

Type locality of ***Phyllosoma commune***: "Taken at Porto Praya and during the voyage until 2,58,0 S lat. 9,21,22 E long." (West Africa from Porto da Praia, Ilha de São Tiago, Cape Verde Islands, 14°54'N, 23°31'W, and from there to off Gabon 2°58'S, 9°21'22"E). Four syntypes in BM, no. 170 (dry, condition fair).

Type locality of ***P. rissonii***: "Nicé", S. France. Whereabouts of type material unknown.



front margin of carapace

Type locality of ***P. longipes*** Pfeffer: "Monrovia" (Liberia, 6°19'N 10°48'W) and "St. Thomé, West-Afrika" (Ilha de São Thomé, 0°12'N, 6°39'E). Syntypes in ZMH.

Type locality of ***Palinustus phoberus:*** "Embouchure de la Gambie et de la Casamence "(= mouths of the Gambia River, Gambia, and of the Casamence River, southern Senegal). Types in MP, no longer extant.

Type locality of ***Puer atlanticus***: " dans le trémail, par 20 mètres de profondeur, au voisinage de Sainte-Lucie, île du Cap Vert " (= Ilha de Santa Luzia, Cape Verde Islands, 16°46'N 24°45'W); holotype in MOM, no. 380624 (in alcohol).

Geographical Distribution : Eastern Atlantic region: west coast of Africa between Cape Juby (Morocco) and Mocâmedes (S. Angola), and western Mediterranean (east coast of Spain, south coast of France) (Fig. 290).

Habitat and Biology : The species inhabits shallow water from the sublittoral to 40 m, but is mostly found between 5 and 15 m. It seems to prefer rocky bottoms.

Size : Maximum total body length 35 cm, usually not more than 25 cm.

Interest to Fisheries : The species is fished for throughout its range, mostly with vertical nets or by trawling; it is also taken by hand or with lobster pots. The lobsters are sold fresh locally. French (Breton) and Spanish fishing boats bring the specimens alive (or frozen) to France and Spain where they are marketed. In some places in Spain, the lobsters are kept alive in "viviers" before being sold. In Angola "the quantity of "lobsters" is not sufficient to assure the development of fisheries on large commercial scale" (Da Franca, 1966: 1).

Local Names : ANGOLA: Lagosta verde; CAPE VERDE ISLANDS: Lagosta verde; GAMBIA: Soum; GHANA: Blue crawfish; MOROCCO: Azeffane, Bakhouche, Langusta (also used for ***Palinurus*** species); SENEGAL: Soum, Soumpé.

Literature : Fischer, Bianchi & Scott (eds), 1981: vol. 5; Williams, 1986: 21, figs 50, 79 j-k; Fischer, Bauchot & Schneider (eds), 1987: 311.

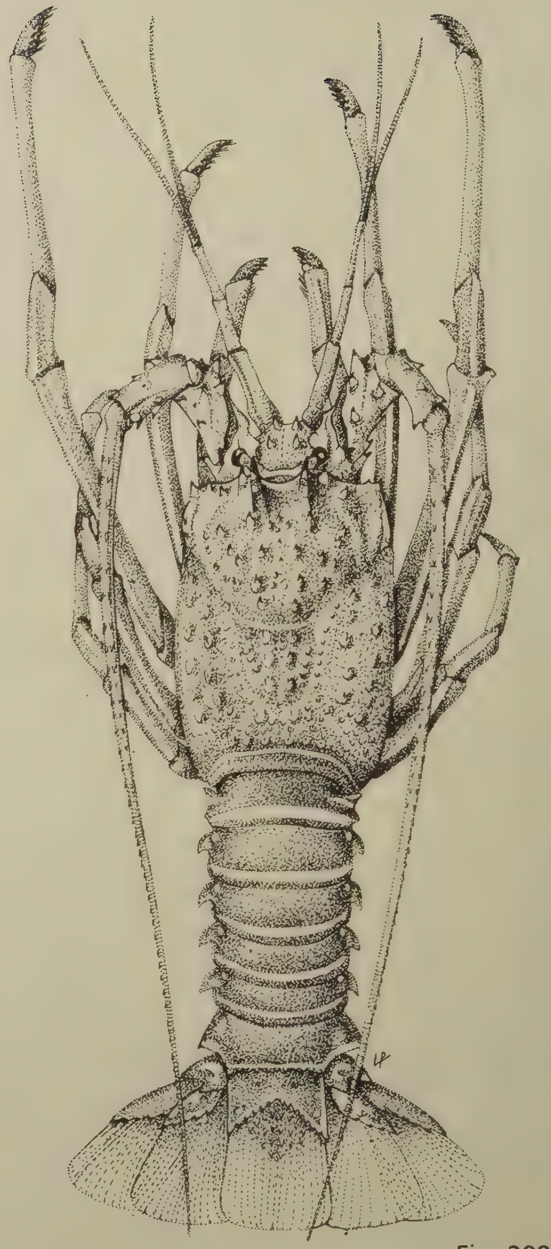


Fig. 289

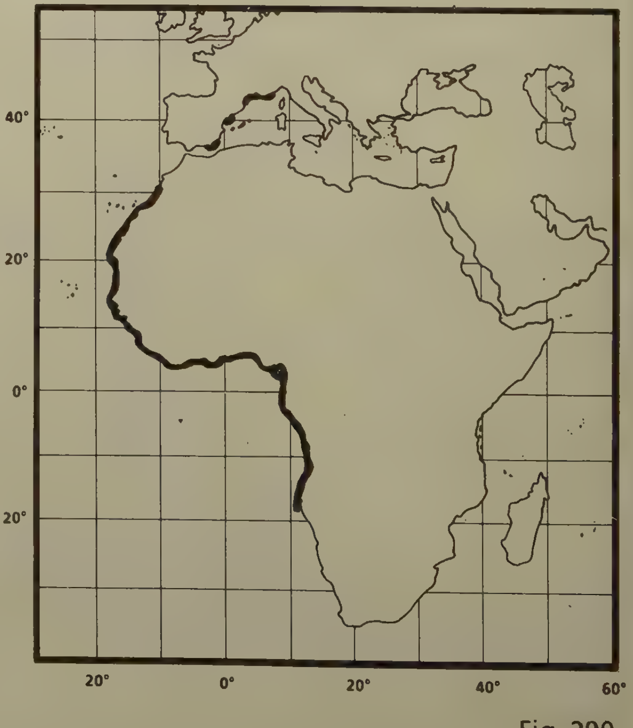


Fig. 290

Panulirus stimpsoni Holthuis, 1963

Fig. 291

PALIN Panul 19

Panulirus stimpsoni Holthuis, 1963, Proceedings Koninklijke Nederlandse Akademie Wetenschappen, (C) 66:54.

Synonyms: ***Palinurus godeffroyi*** (Pfeffer MS.) Holthuis, 1978.

FAO Names : En - Chinese spiny lobster.

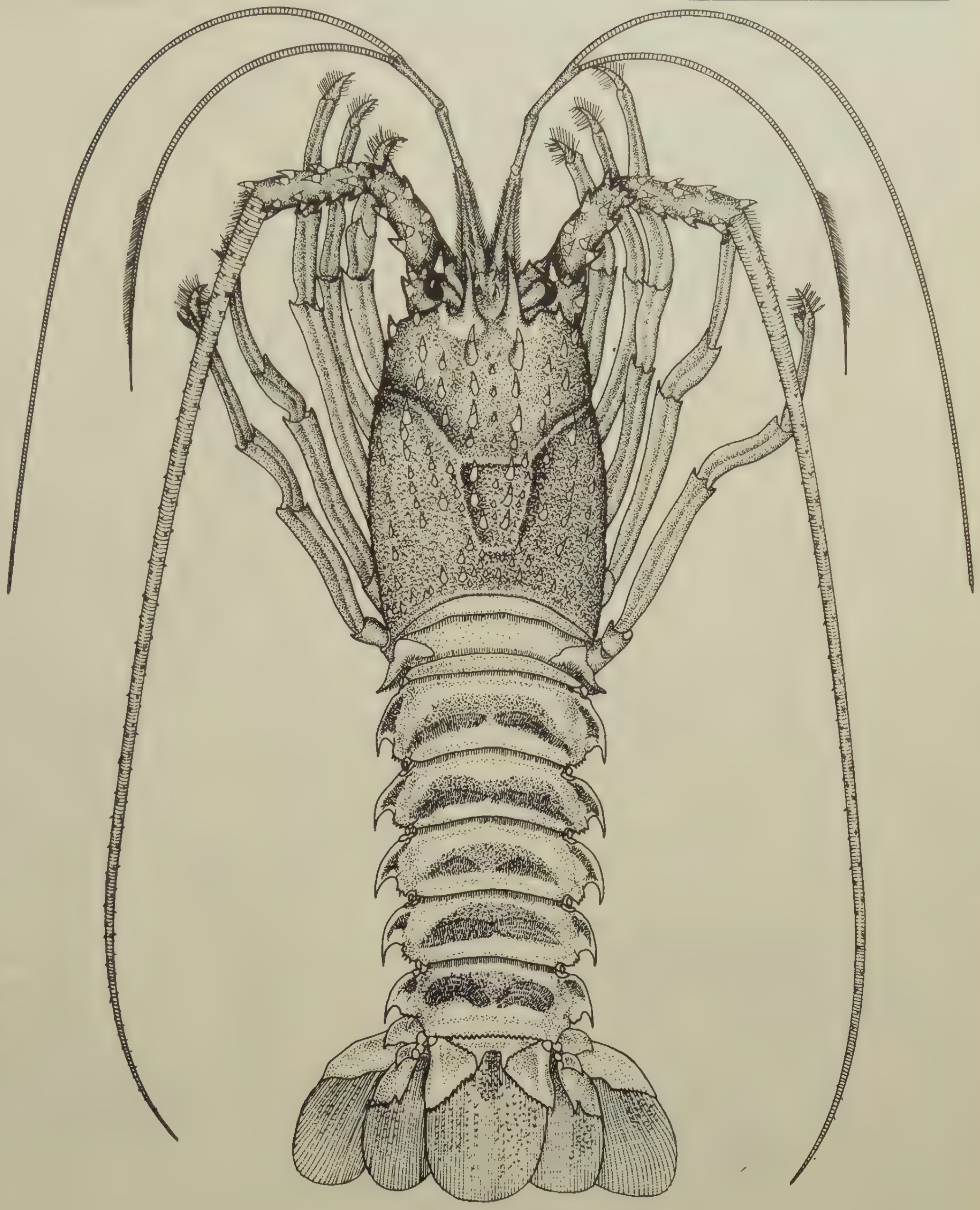
Type : Type locality of ***Panulirus stimpsoni***: "Hong Kong". Holotype female in RMNH, no. D 3541.

Type locality indication of ***Palinurus godeffroyi***: "Südsee" [= Pacific Ocean], indication probably incorrect. Holotype male in ZMH, no. 8005.

Geographical Distribution : Indo-West Pacific region. Coast of southern China between Shanghai and Shantou (= Swatow); Hong Kong; Taiwan. Recently also found in the Gulf of Thailand off Chonburi province (Fig. 292).

Habitat and Biology : The species seems to inhabit rocky areas in shallow water.

Size : Known carapace lengths: 6.5 to 10.5 cm (males), and 5 to 6.5 cm (females). The corresponding total body lengths are about 16 to 28 cm (males), and 13 to 16 cm (females).



(after George & Fischer, 1978)

Fig. 291

Interest to Fisheries : The species is of commercial interest notwithstanding its relatively small size. Caught throughout its range, mostly with tangle nets, rarely by lobster traps. Sold fresh on local markets. In Hong kong, it is mainly caught in February/March and August/September. The species is reared and cultured in China (Liu, 1986:44).

Local Names : HONG KONG: Green lobster, Luk Sik Lung Ha; THAILAND: Kung mangkon

Literature : George & Fischer, 1978:93-95, fig 1; Holthuis, 1978:95-100, pl. 1; Liu, 1986:45.

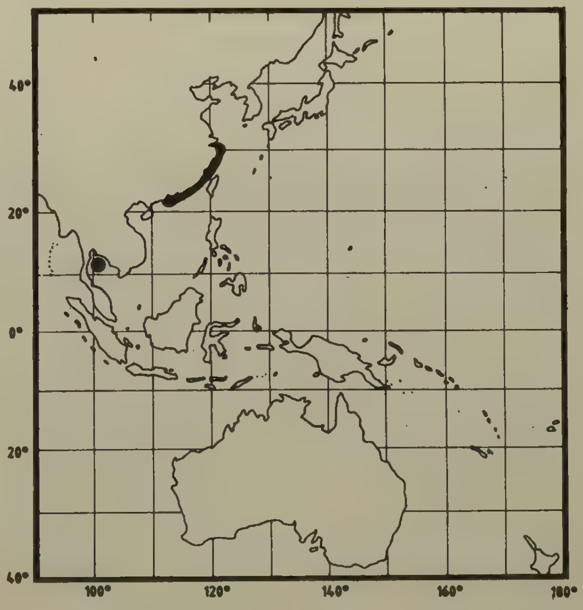


Fig. 292

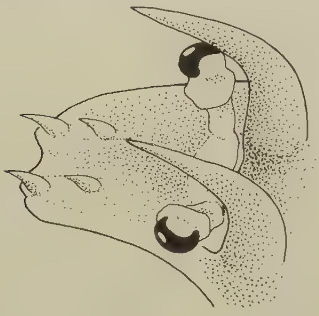
Panulirus versicolor (Latreille, 1804)

Fig. 293

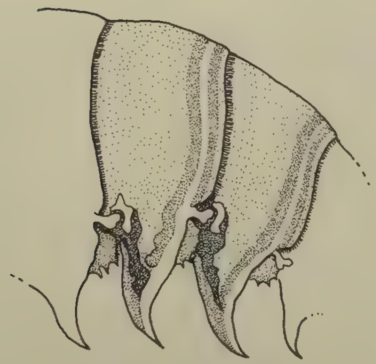
Palinurus versicolor Latreille, 1804, Annales Muséum Histoire naturelle, Paris, 3:394.

Synonyms: ***Palinurus taeniatus*** Lamarck, 1818; ***Panulirus taeniatus*** - White, 1847; ***Palinurus (Panulirus) ornatus decoratus*** Heller, 1865; ***Puer spiniger*** Ortmann, 1894; ***Panulirus demani*** Borradaile, 1899; ***Senex ornatus laevis*** Lanchester, 1901; ***Puerulus spiniger*** - Calman, 1909; ***Panulirus ornatus laevis*** - De Man, 1916.

FAO Names: **En** - Painted spiny lobster; **Fr** - Langouste barriolée; **Sp** - Langosta colorete.



antennular plate



abdominal somites (lateral view)

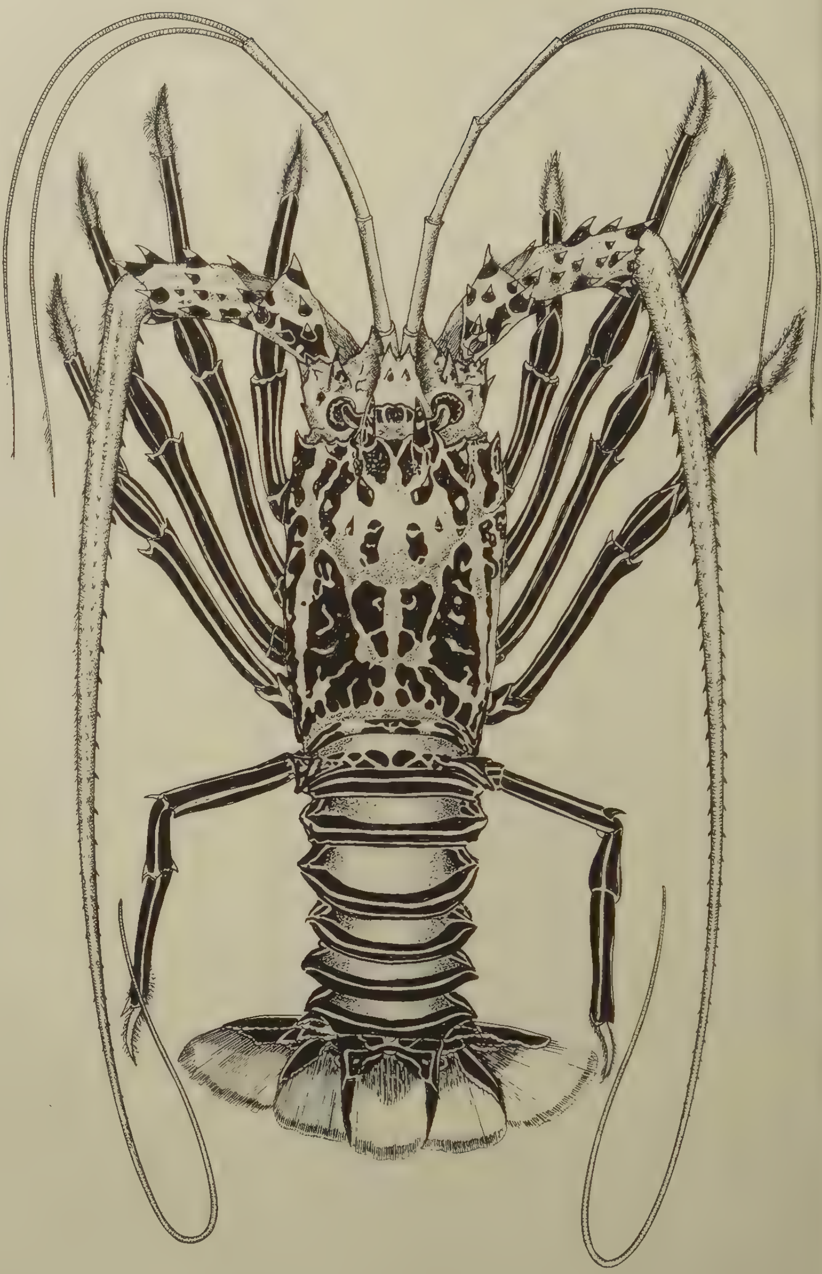


Fig. 293

Type: Type locality of ***Palinurus versicolor***: "Cette jolie espèce nous est arrivée par la frégate le Naturaliste". The "Naturaliste" together with the "Géographe" left Le Havre, France, on 18 October 1800 on a voyage of discovery to Australia. F. Peron and C.A. Lesueur, whose names as zoologists are well known in connection with this expedition, shipped on the Géographe, the zoologists on board the "Naturaliste" were G.J.B.M. Bory de St Vincent and D. Dumont. Bory de St Vincent, however, did not travel beyond Mauritius, where he stayed for a year. The two ships arrived at Mauritius (Ile de France) on 16 March 1801 and left 25 April. The "Naturaliste" reached S.W. Australia on 27 May 1801 and went from there to Timor where she stayed from 22 August to 13 November 1801. From Timor the "Naturaliste" went around S.W. Australia to Tasmania and Port Jackson, Sydney, and returned from there the same way to Shark Bay, Western Australia, which was left 23 March 1803 for Timor. On 3 June 1803 the ship headed home from Timor via Mauritius. The only two localities where the "Naturaliste" could have collected ***Panulirus versicolor*** are Mauritius and Timor. It seems best to select Mauritius as the restricted type locality. Types in MP, see under type of ***P. taeniatus***.

Type locality of ***P. taeniatus***: "Habite les mers de la Nouvelle Hollande" Lamarck (1818:211) cited ***P. versicolor*** Latreille as a synonym of his ***P. taeniatus*** (although he himself used the name ***versicolor*** for a species that probably is ***P. penicillatus***). As Lamarck claims that the type specimens of his ***P. taeniatus*** are rather small, just as Latreille (1804) did for his own ***P. versicolor***, it is possible, that ***taeniatus*** is just a new name for ***versicolor*** Latreille, and that the type material of the two is the same. The fact that the object of the voyage of the "Naturaliste" was to explore Australia ("Nouvelle Hollande"), may be the reason that Lamarck gave Australia as type locality for ***P. taeniatus***, while its types probably were actually collected in Mauritius or Timor. In the Paris Museum, there are 3 specimens identified by Lamarck as ***P. taeniatus*** labelled "Ile de France" (= Mauritius), which may be the syntypes of this species and of ***P. versicolor***.

Type locality of ***P. ornatus decoratus***: "Java", Indonesia. Type material in NMW.

Type locality of ***Puer spiniger***: "Amboina", Moluccas, Indonesia. Depository of syntypes unknown.

Type localities of ***Panulirus demani***: "Blanche Bay, New Britian" (1 male syntype in ZMC, in alcohol, good condition), "Amboina" (Moluccas, Indonesia), "Neu-Guinea" (= southeast coast of Papua New Guinea between Yule Island and East Cape), "Thursday Island" (Torres Strait, Australia) (material from the last three localities reported upon by Ortmann, 1894, the syntypes probably in the Zoological Institute, University of Jena, Germany), "Java-See" (Java Sea, Indonesia) (De Man, 1896; 2 juveniles syntypes in ZML).

Type locality of ***Senex ornatus laevis***: "Singora" (= Songkhla, S. Thailand on coast of Gulf of Thailand). Holotype male in ZMC, in alcohol, condition good.

Geographical Distribution : Indo-West Pacific region: entire Red Sea and east coast of Africa (south to Natal), to southern Japan, Micronesia, Melanesia, northern Australia and Polynesia (Fig. 294).

Habitat and Biology : In shallow water, from the sublittoral down to 15 m depth; in coral reef areas, often on seaward edges of the reef plateau. In clear water also in surf areas. The species is nocturnal and not gregarious; in daytime, it hides in crevices and cavities of the rocks.

Size : Maximum total length about 40 cm, average length less than 30 cm.

Interest to Fisheries : The species is taken wherever it occurs, mostly for local use; like all spiny lobsters it is considered to be excellent food. It is taken in daytime by divers, either by hand or with spears; at night it is hunted and speared at the reefs with the help of torch lights, it rarely enters traps. On the west coast of Thailand, it is sold fresh in markets or directly to restaurants; mounted specimens, usually in fancy glass cases are sold as curios to tourists.

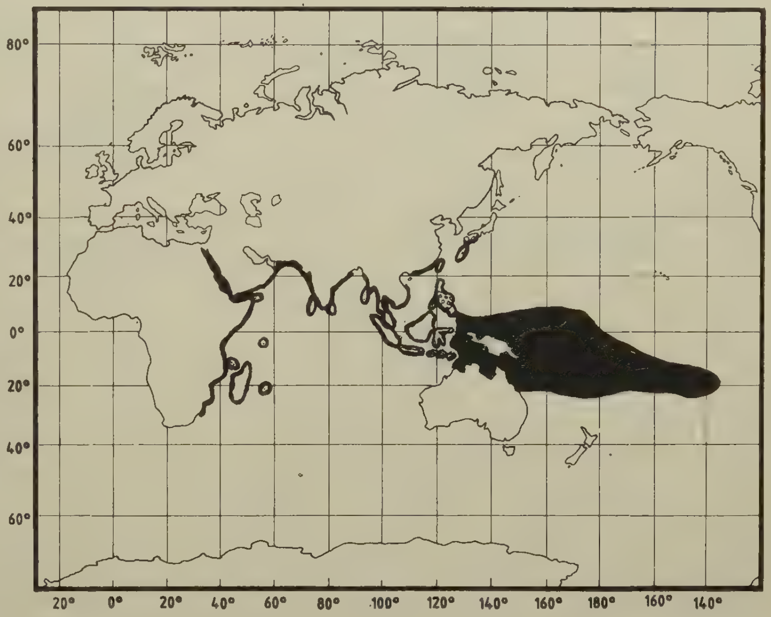


Fig. 294

Local Names : AUSTRALIA: Painted rock lobster; FIJI: Painted rock lobster, Uraudina; HONG KONG: Huk paak mun lung ha; INDONESIA: Udang barong; JAPAN: Goshiki ebi, Goshiki-ise-ebi; MALAYSIA: Udang karang; MOZAMBIQUE: Lagosta pintada; NEW CALEDONIA: La porcelaine, Porcelain crayfish; PAKISTAN: Kikat (Sindhi), Kikka (Baluchi); PHILIPPINES: Banag, Banagan, Marine crayfish, Painted crayfish; SOUTH AFRICA: Striped crayfish; THAILAND: Kung mangkon; VIET NAM: Tôm hum.

Literature : Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986:23, figs 55, 80 c-d.

Projasus George & Grindley, 1964

PALIN Proja

Projasus George & Grindley, 1964, Journal Royal Society Western Australia, 47(3):87. Gender masculine.

Type Species: by original designation and monotypy: ***Jasus parkeri*** Stebbing, 1902.

Synonyms : ***Isopuerulus*** Bahamonde, 1963, Noticiario mensual Museo Nacional Historia Natural, Santiago, Chile, 7(81):4. Type species, by monotypy: ***Jasus parkeri*** Stebbing, 1902. Gender masculine. Name unavailable as it, when established, was not "accompanied by a description or definition that states in words characters that are purported to differentiate the taxon", and neither is there "a bibliographic reference to such a published statement" (Art. 13 of the International Code of Zoological Nomenclature).

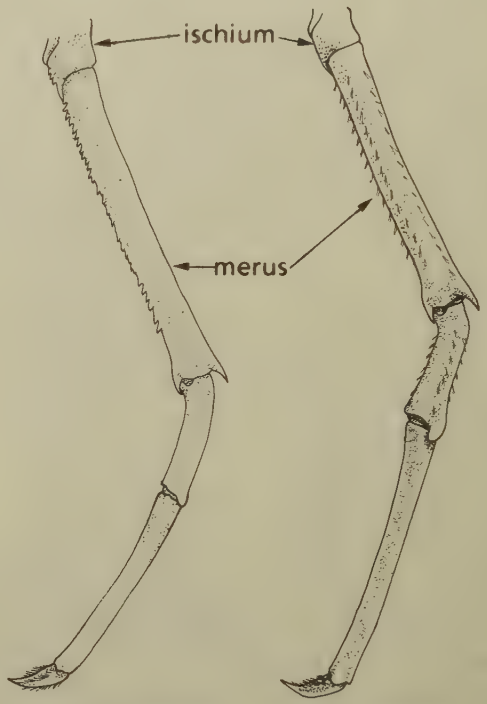
Isopuerulus Bahamonde, 1965, Noticiario mensual Museo National Historia natural, Santiago, Chile, 10(112):5. Type species by monotypy: ***Jasus parkeri*** Stebbing, 1902. Gender masculine. This time the name is availably established, even though barely so, as the author states that the genus is smaller than the genus ***Jasus*** ("de menor talla que la anterior"). However, now it is a junior objective synonym of ***Projasus*** George & Grindley, 1964.

At present two species are known to belong to this genus, neither is of importance to fisheries. On account of the scarcity of available material the taxonomy at the species level is not yet quite clear.

Key to Species :

1a Eastern Pacific. Spinules present on the ventral margin of the merus and ischium of the pereiopods (Fig. 295a) .... ***P. bahamondei*** (Fig. 296)

1b. Indo-West Pacific. No spinules on merus and ischium of the pereiopods (295b) .... ***P. parkeri*** (Fig. 298)



a. ***P. bahamondei*** b. ***P. parkeri***

pereiopod Fig.295

Projasus bahamondei George, 1976

Fig. 296

PALIN Proja 1

Projasus bahamondei George, 1976, Crustaceana, 30(1):27, text-fig. 1, pl. 1.

Synonyms : Before 1976 not distinguished from ***Projasus parkeri.***

FAO Names : En - Chilean jagged lobster.

Type : Type locality: "San Ambrosio Island, south-east Pacific, 26°21'S 79°47'W, 175 m". Holotype female in WAM, no. 104-72.

Geographical Distribution : Off the Chilean Coast between Huasco (Atacama) and Constitución (Maule), roughly between 29° and 35°S; also at the Islas Desventuradas, and near Juan Fernandez (Fig. 297).

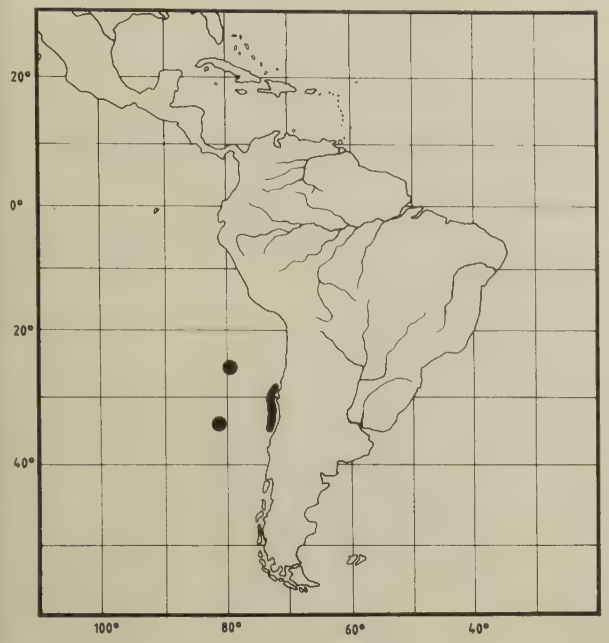


Fig. 297

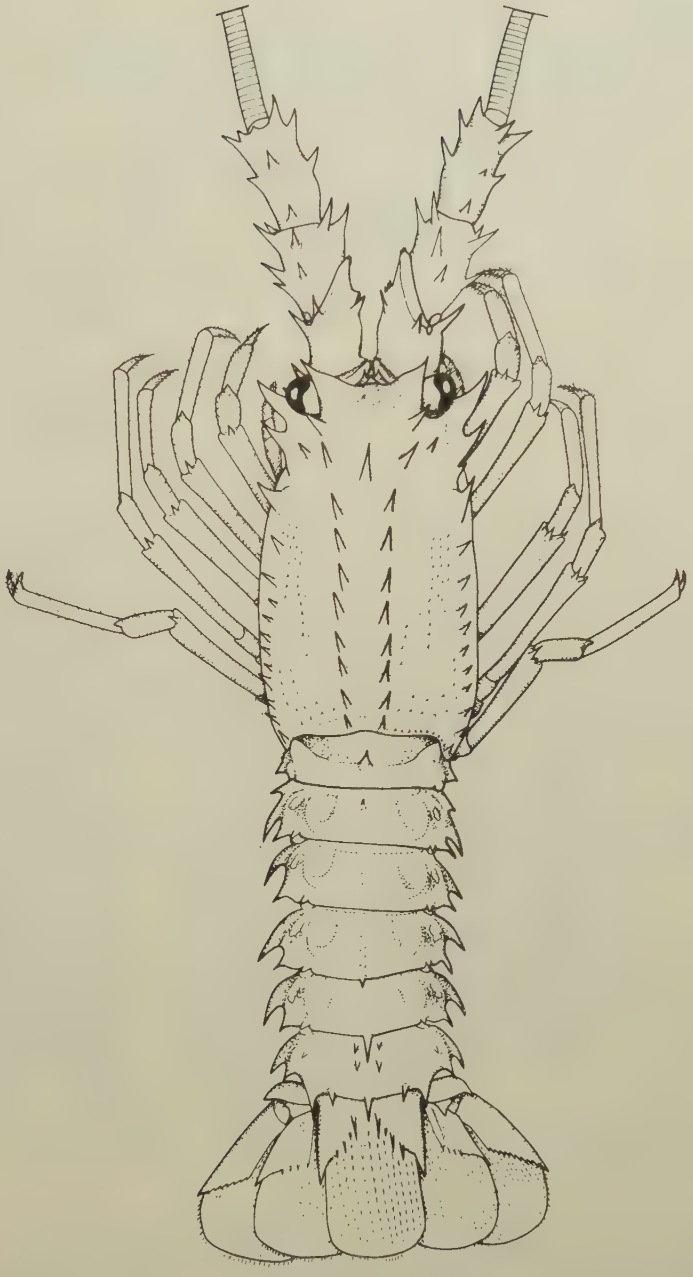
Habitat and Biology : Depth range from 175 to 300 m, on substrates of sandy mud, muddy sand and gravel.

Size : Maximum total body length about 18.5 cm; carapace length up to 7.5 cm.

Interest to Fisheries : Practically none. The species is taken as by-catch by the trawlers that fish for the shrimp ***Heterocarpus reedi*** Bahamonde. Báez & Ruiz (1985) suggested that the species might be sufficiently abundant near Juan Fernandez and the Islas Desventuradas to be of interest to fisheries.

Local Names : CHILE: Dalmacita, Langosta de Valparaiso, Langosta enana.

Literature : Original description; Webber & Booth, 1988:89-92, figs 6,8,9.



(from Retamal, 1981)

Fig. 296

Projasus parkeri (Stebbing, 1902)

Fig. 298

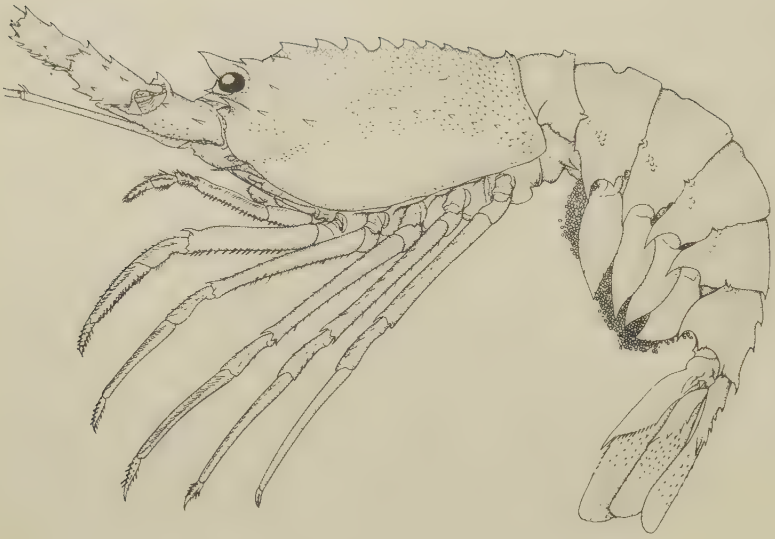
PALIN Proja 2

Jasus parkeri Stebbing, 1902, Marine Investigations South Africa, 2:39, pl. 7.

Synonyms : ***Puerulus parkeri*** - Holthuis, 1946; ***Isopuerulus parkeri*** - Bahamonde, 1963.

FAO Names : En - Cape jagged lobster.

Type : Type locality: "Buffalo River north 15 miles. Depth, 310 fathoms [= 567 m]. Bottom, coral and mud", Natal, South Africa, about 33°S 28°E. Holotype male in SAM, no. A 993 (in alcohol; condition good).



lateral view

Geographical Distribution : S.W. Africa (Valdivia Bank off Namibia); S.E. Africa (Cape Province north of East London, and Natal, South Africa); St. Paul Island; New Zealand (Fig. 299). A ***Projasus*** puerulus stage taken off New South Wales, might belong here. A distribution map is provided by Webber & Booth (1988).

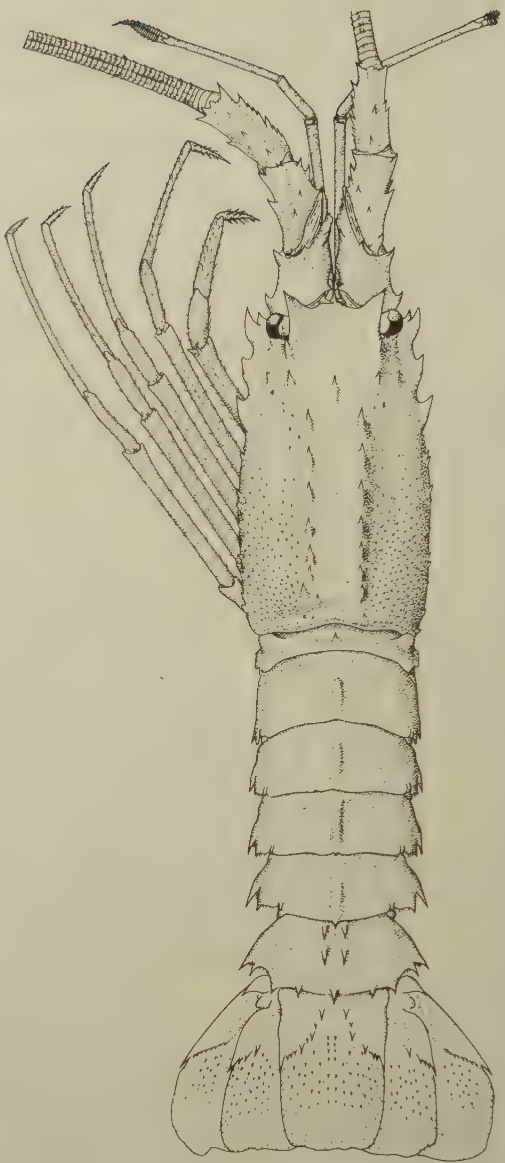
Habitat and Biology : Depth range from 370 to 841 m; bottom: mud with rocks and coral.

Size : Carapace length of S.W. African females 7.0-7.8 cm. Maximum total length for East African material: 13.4 cm (males) and 15 cm (females), maximum carapace length about 6 cm for both sexes. Specimens from St Paul Island had carapace length 7 cm (in both sexes). However, the sizes of specimens from New Zealand reported upon by Webber & Booth (1988) were distinctly larger: carapace length 6.9-8.2 cm (males) and 6.8-9.2 cm (females).

Interest to Fisheries : So far none. The species is rare, and even though it lives on soft substrates, evidently is seldom caught in trawls.

Local Names : SOUTH AFRICA: Parker's crayfish.

Literature : Barnard, 1950:540; Webber & Booth, 1988:81-92, figs 1-9; Melville-Smith, 1990.



dorsal view

Fig. 298

(both from Webber & Booth, 1988)

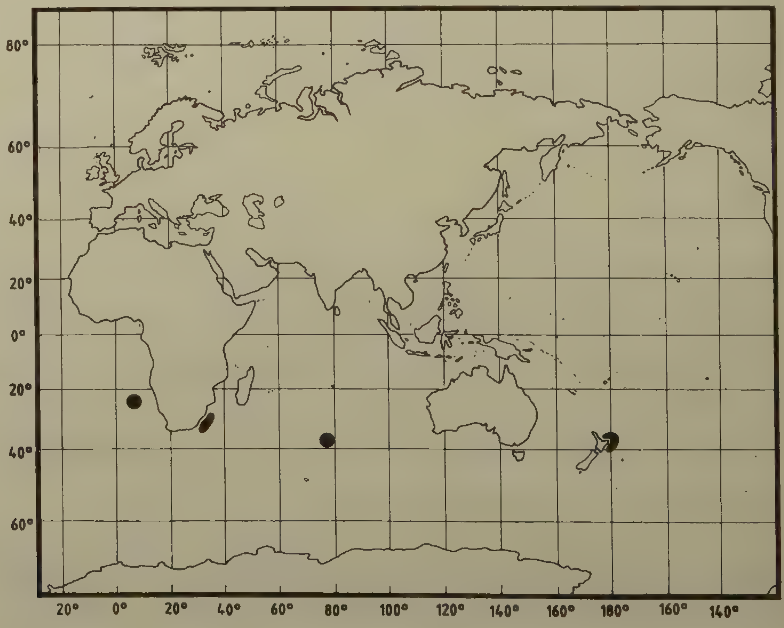


Fig. 299

Puerulus **Ortmann, 1897**

PALIN Puer

Puerulus Ortmann, 1897, American Journal Science, (4)4:290. Replacement name for the preoccupied ***Puer*** Ortmann, 1891; therefore with the same type species. Gender masculine. Name placed on the Official List of Generic Names in Zoology, in Opinion 519 (published in 1958).

Type Species: ***Panulirus angulatus*** Bate, 1888.

Synonyms: ***Puer*** Ortmann, 1891, Zoologische Jahrbücher, Systematik, 6:15,37. Type species, selected by Calman, 1909, Annals Magazine Natural History, (8)3:442: ***Panulirus angulatus*** Bate, 1888. Gender masculine. An invalid junior homonym of ***Puer*** Lefebvre, 1842 (Insecta Neuroptera).

So far 4 species have been recognized in this genus, all deepwater forms. One of them (***P. sewelli***) is the subject of a minor fishery. The others are not fished for, but are of potential interest.

Key to Species (after Berry, 1969):

1a. Postorbital spine present. No teeth, but 6 postcervical and 6 intestinal tubercles on the median keel of the carapace. Tubercles on carapace low and largely obscured by pubescence (Fig. 300a). Eyes large, much broader than long .... ***P. velutinus*** (Fig. 307)

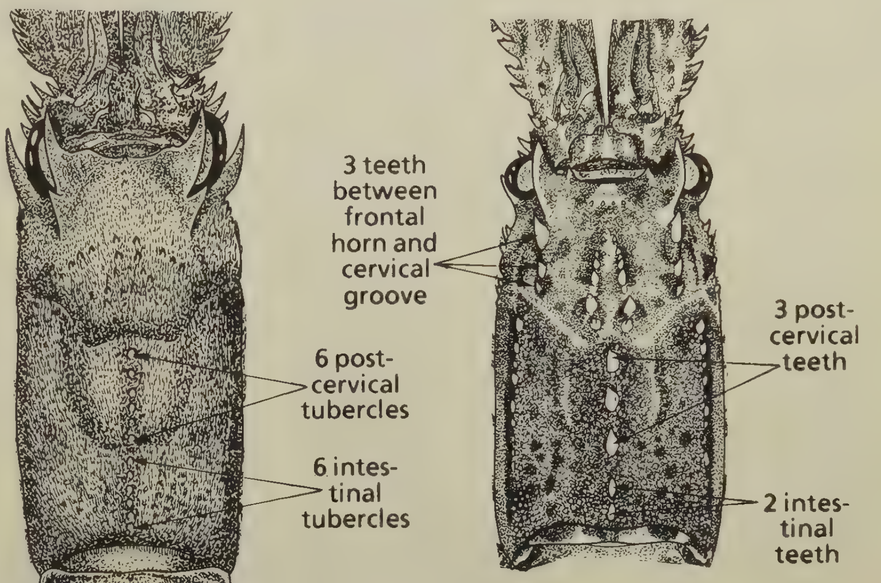
1b. Postorbital spine absent. Median keel of carapace with 3 to 5 postcervical and 2 to 4 intestinal teeth. Tubercles of carapace usually distinct and not obscured by the pubescence. Eyes smaller, longer than broad

2a. Three or more teeth between the frontal horns and the cervical groove. Median keel of the carapace with 3 postcervical and two intestinal teeth (Fig. 300b). Fifth pereiopod of male not chelate .... ***P. angulatus*** (Fig. 301)

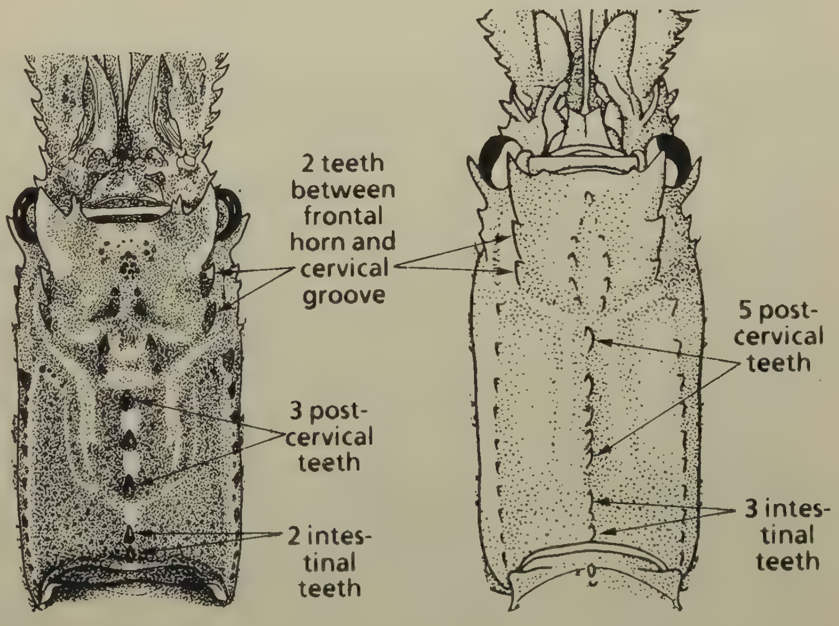
2b. Two teeth between frontal horns and the cervical groove (Fig. 300c,d)

3a. Median keel of carapace with 3 postcervical and 2 (occasionally 3 or 4) intestinal teeth (Fig. 300c). Fifth pereiopod of male chelate .... ***P. carinatus*** (Fig. 303)

3b. Median keel of carapace with 5 postcervical and 2 or 3 intestinal teeth (Fig. 300d). Fifth pereiopod of male not chelate .... ***P. sewelli*** (Fig. 305)


3 teeth between frontal horn and cervical groove
6 post-cervical tubercles
6 intes-tinal tubercles
3 post-cervical teeth
2 intes-tinal teeth

a. ***P. velutinus*** b. ***P. angulatus***


2 teeth between frontal horn and cervical groove
3 post-cervical teeth
2 intes-tinal teeth
5 post-cervical teeth
3 intes-tinal teeth

c. ***P. carinatus*** d. ***P. sewelli***

carapace (dorsal view) Fig. 300

Puerulus angulatus (Bate, 1888)

Fig. 301

PALIN Puer 2

Panulirus angulatus Bate, 1888, Report Voyage Challenger, Zool., 24:81, pl. 11 figs 2-4. Name placed on the Official List of Specific Names in Zoology, in Opinion 519 (published in 1958).

Synonyms: ***Puer angulatus*** - Ortmann, 1891; ***Puerulus gracilis*** Kubo, 1939.

FAO Names : En - Banded whip lobster.

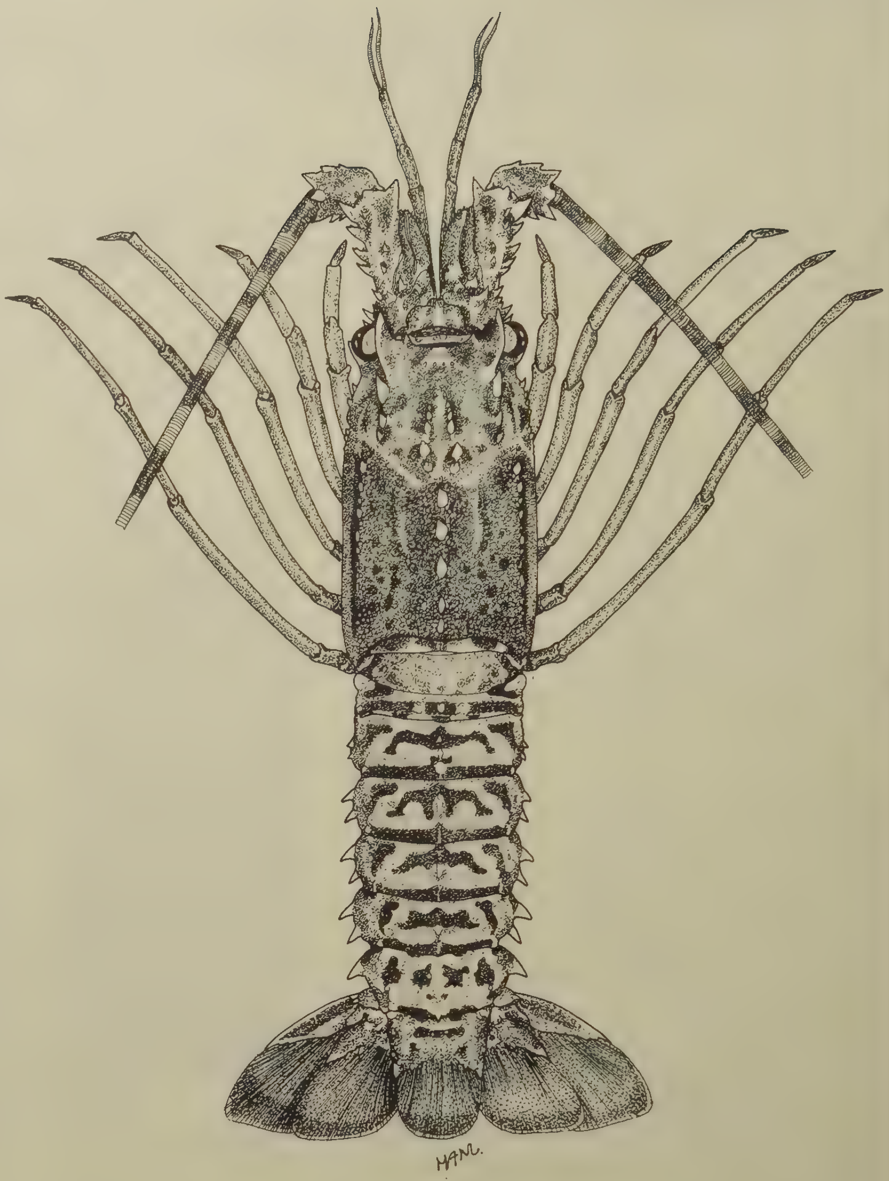
Type : Type locality of ***P. angulatus***: "Challenger" Station 219, "lat. 1°54'S. long. 146°39'40"E; Eastern [read: Western] Pacific, north of New Guinea; depth, 150 fathoms [= 274 m]; bottom, coral mud". Holotype male in BM, no. 88.22 (in alcohol, condition fair).

Type locality of ***Puerulus gracilis***: "off Kominato, Prov. Bôsyû [Honshu, Japan] at at depth of about 170 fathoms [= 310 m]". Depository of types unknown.

Geographical Distribution: Indo-West Pacific region, from the east and south-east coast of Africa (Zanzibar, Mozambique, Natal) and the western Indian Ocean, to Japan, the Philippines, Indonesia, New Guinea and Western Australia (Fig. 302).

Habitat and Biology : Depth range from 274 to 536 m, on soft substrates (mud or sand).

Size : Maximum carapace length is 7.3 cm, corresponding to a total body length of about 21 cm.



(after Berry, 1969)

Fig. 301

Interest to Fisheries : At present the species is accidentally caught by fishermen, as is the case for the type of ***Puerulus gracilis***, which was taken in a gill net ("naname-ami") intended for flatfishes; specimens from Natal and Mozambique were taken by commercial trawlers, but in very small numbers. Crosnier & Jouannic (1973:13) report that experimental fishing near Madagascar produced only very few specimens. George (1983:16) observed that off Port Hedland, Western Australia, "the commercial prospects [of 4 species of ***Metanephrops*** and of] the whip lobster ***Puerulus angulatus*** are probably the most encouraging". Experimental fishing with different types of gear, and better knowledge of habitat and biology of this species are required in order to assess its real potential as a fisheries resource.

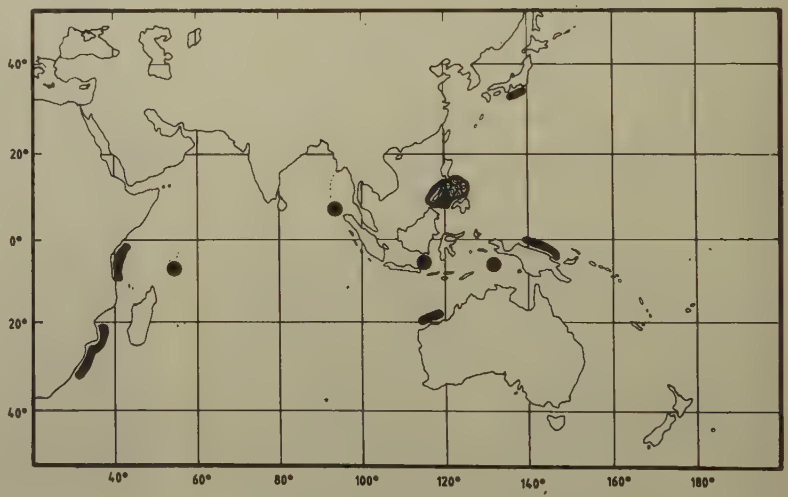


Fig. 302

Local Names : AUSTRALIA: Whip lobster; JAPAN: Gusoku-ebi; MOZAMBIQUE: Lagosta listrada.

Literature : Holthuis, 1966:267; Berry, 1969:247, pl. 1 fig. 2, pl. 2 fig. 2, pl. 3 fig. 2.

Puerulus carinatus Borradaile, 1910

Fig. 303

PALIN Puer 3

Puerulus carinatus Borradaile, 1910, Transactions Linnean Society London, (Zool.), (2)13: 261.

Synonyms: The species was synonymized with ***P. angulatus*** by Holthuis (1966:267) but incorrectly so, as shown by Berry (1969).

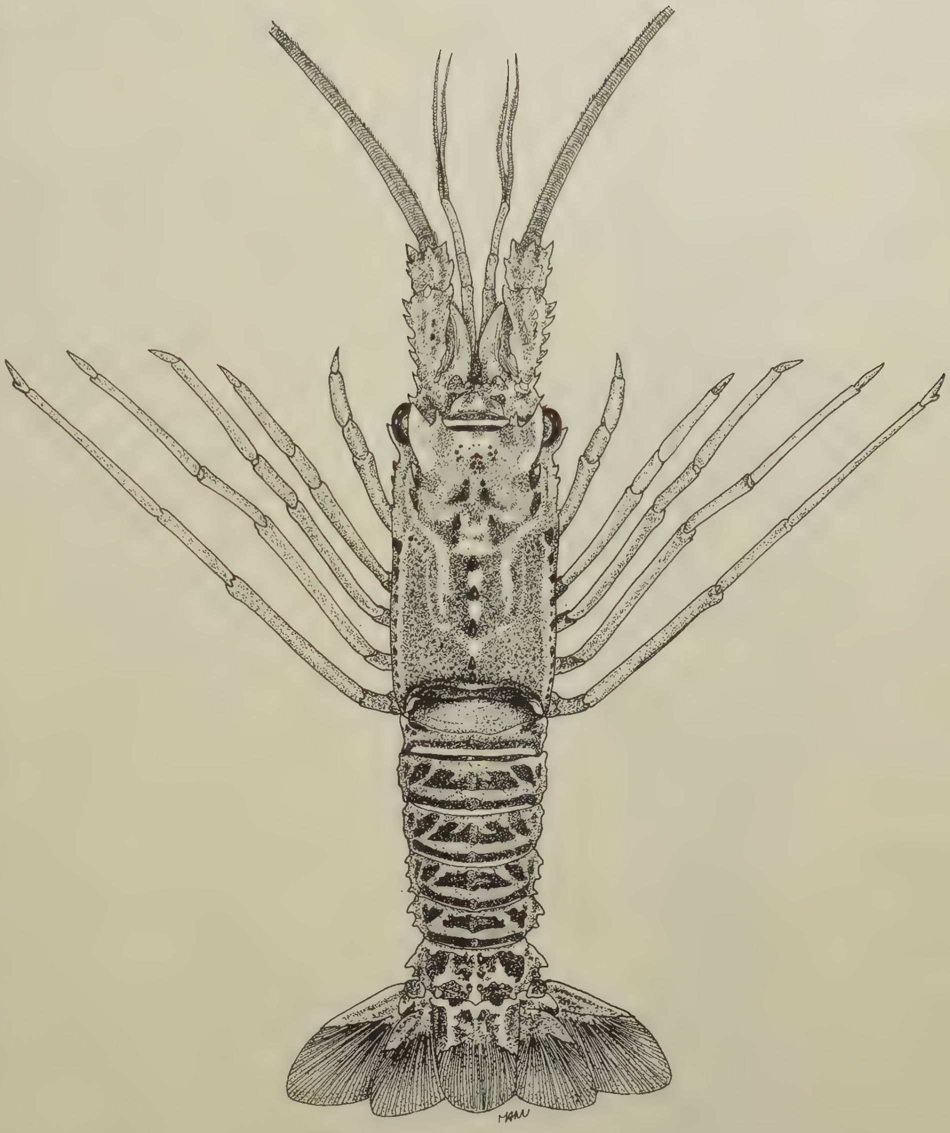
FAO Names : En - Red whip lobster.

Type : Type locality: "Dredged in 125 fathoms off Saya de Malha bank", western Indian Ocean. Holotype in ZMC, lost. Neotype locality: "N.E. of Ouro Point, southern Mozambique, approx. 26°50'S 33°00'E, depth 320 metres". Neotype male, selected by Berry (1969:240), in RMNH no. D. 25535.

Geographical Distribution: Western Indian Ocean: Zanzibar, Mozambique, Natal (South Africa), Madagascar, Saya de Malha Bank (Fig. 304).

Habitat and Biology : Known from depths between 228 and 450 m; on soft substrates (sandy mud, or sand).

Size : Maximum total body length: 18 cm (males), and 20 cm (females); maximum carapace length: 6.4 cm (males), and 7.4 cm (females); average total body length about 15 to 16 cm.



(after Berry, 1969)

Fig. 303

Interest to Fisheries : Very slight at present. Although evidently occurring on trawlable bottoms, very few specimens have been accidentally taken by trawlers.

Local Names : MOZAMBIQUE: Lagosta carinada.

Literature : Berry, 1969:240, text-fig. 1a,b, pl. 1 fig.1, pl. 2 fig. 1, pl. 3 fig. 1.

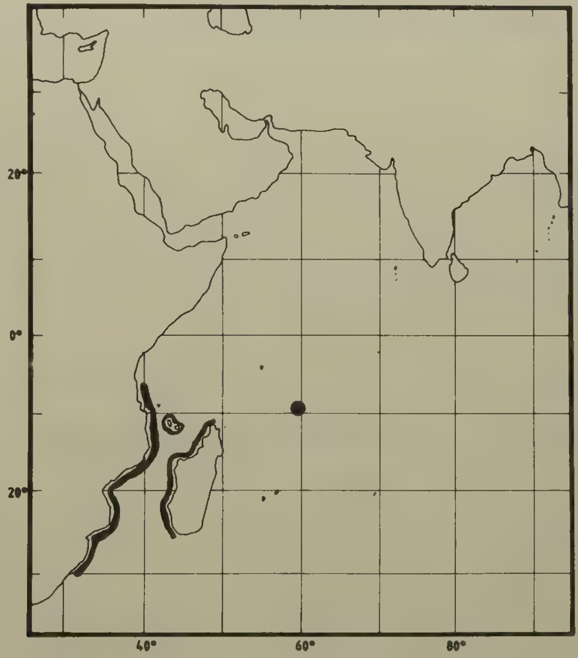


Fig. 304

Puerulus sewelli Ramadan, 1938

Puerulus sewelli Ramadan, 1938, Scientific Reports John Murray Expedition, 5(5): 128, figs 3-5.

Synonyms: ? ***Phyllamphion santuccii*** Belloc, 1959.

FAO Names : **En** - Arabian whip lobster; **Fr** - Langouste fouet arabe; **Sp** Langosta de fusta arabica.

Type : Type locality of ***P. sewelli***: "Gulf of Aden", "Gulf of Manaar and the Arabian Sea", through the lectotype selection by Holthuis (1966:271) restricted to Gulf of Aden, 13°16'00"N, 46°20'24"E - 13°16'36"N 46°14'00"E, 220 m deep, bottom green mud. Lectotype male in BM, no. 1969:61-64 (in alcohol, condition good); paralectotypes in BM, ZSI, USNM.

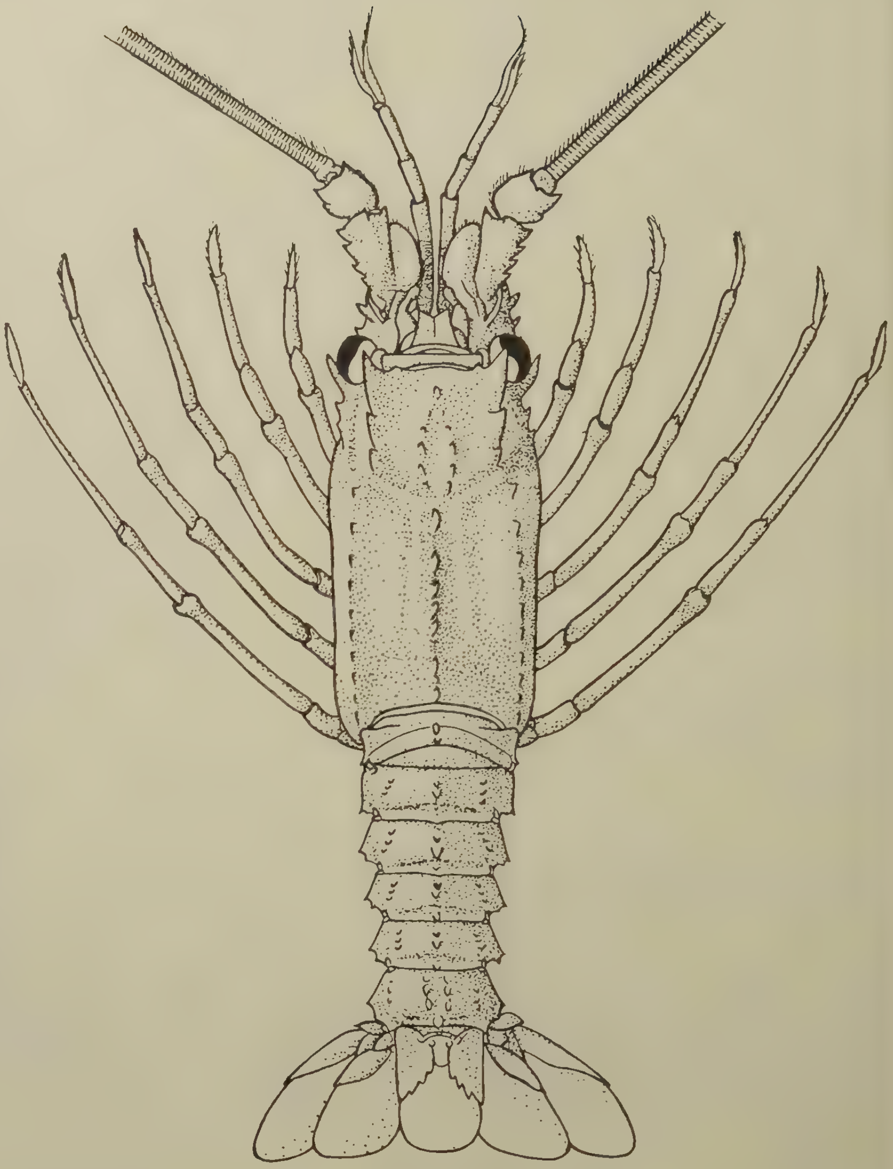
Type locality of ***Phyllamphion santuccii***: "dans le sud-est de Périm", Gulf of Aden; depository of type unknown, possibly in MOM, but not yet located there.

Geographical Distribution : Western Indian Ocean: Somalia, Gulf of Aden, off Pakistan, southwest and south India, Gulf of Mannar (Fig. 306).

Habitat and Biology : Known from depths between 180 and 1 300 m, most common between 180 and 300 m; on a substrate of coarse sand, hard mud and shells.

Size : Maximum total body length about 20 cm, maximum carapace length about 8 cm. Average total length about 15 cm.

Fig. 305



(from Ramadan, 1938)

Fig. 305

Interest to Fisheries : Between 1974 and 1977, the species was commercially fished off the east coast of Somalia. In the Gulf of Aden, experimental trawling was carried out with average catches of 10 to 129 kg/hour. Off S.W. India, rich grounds were found, where the fishery for this species might become commercially rewarding. The annual sustainable yield in that area was estimated at 6 700 tons. The operations were carried out by deep-sea trawlers. The lobster tails were sold deep-frozen.

Local Names : PAKISTAN: Khada kikka (Baluchi), Kikat (Sindhi).

Literature : Fischer & Bianchi (eds), 1984: vol. 5.

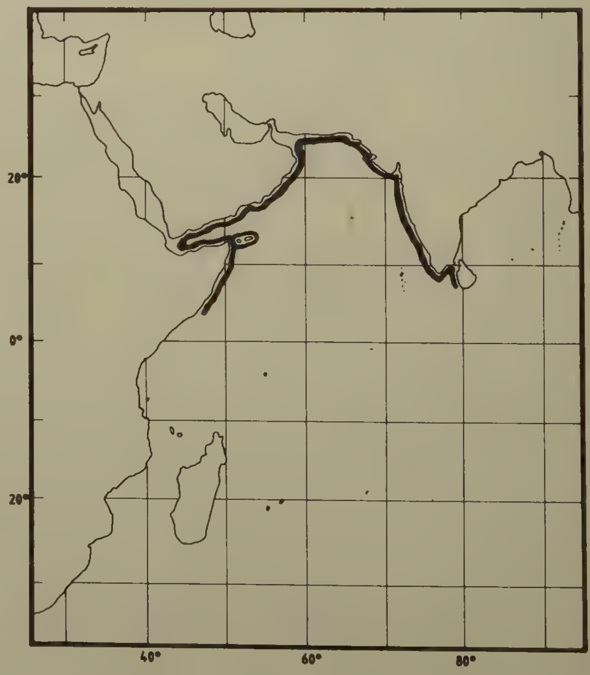


Fig. 306

Puerulus velutinus Holthuis, 1963

Fig. 307

Puerulus velutinus Holthuis, 1963, Proceedings Koninklijke Nederlandse Akademie Wetenschappen, (C)66:55.

FAO Names : En - Velvet whip lobster.

Type : Type locality: "Siboga" Expedition Station 297 "between Roti and Timor, Lesser Sunda Islands, 10°39'S 123°40'E", depth 520 m, soft grey mud with brown upper layer. Holotype male in ZMA, no. De. 101.823, condition fair; paratypes in ZMA no De. 101.823 + 101.824.

Geographical Distribution : Indo-West Pacific region: Malay Archipelago: Philippines and Indonesia (Fig. 308).

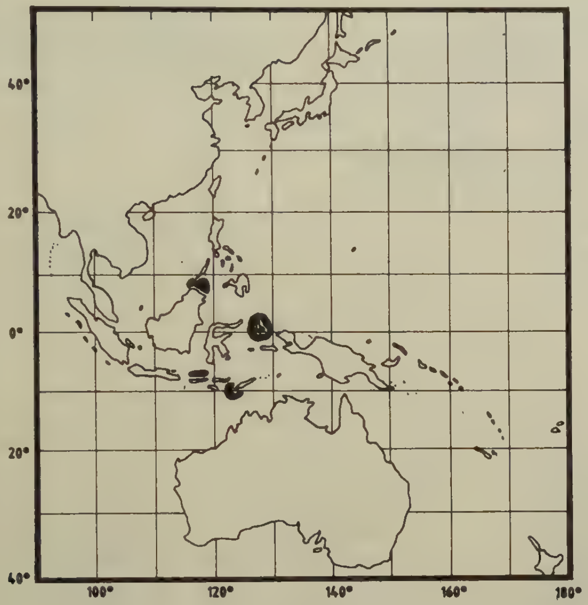


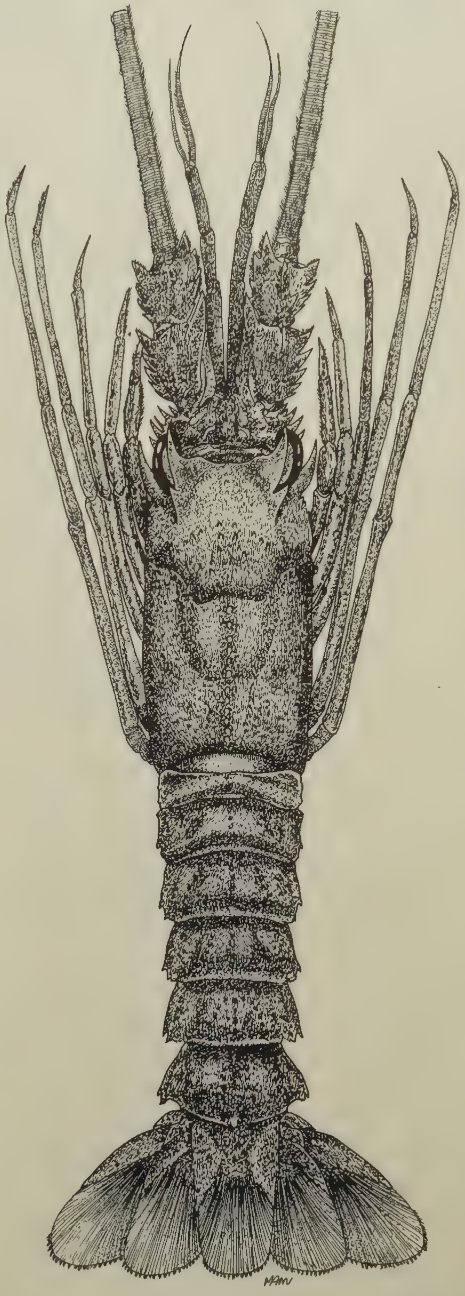
Fig. 308

Habitat and Biology : Depth range from 520 to 683 m; bottom: soft substrate of mud, sand or coral. Ovigerous females have been found in April.

Size : Maximum carapace length: 6.5 cm (males), and 6.2 cm (females), corresponding with a total length of about 19 cm (males) and 18 cm (females). Ovigerous females have a carapace length of 4.7 to 6.1 cm.

Interest to Fisheries : So far none. The fact that the species occurs on soft bottoms and is sometimes collected in relatively great numbers (at "Siboga" Sta. 38 no less than 23 specimens were taken in one haul) indicates that the species might be of commercial interest.

Literature : De Man, 1916:36-42, pl. 2 fig. 5 (as ***P. angulatus***); Holthuis, 1966:273-274.



(after De Man, 1916) Fig. 307

2.2.4 FAMILY SYNAXIDAE Bate, 1881

Synaxidae Bate, March 1881, Annals Magazine Natural History, (5)7:228.

Type Genus: ***Synaxes*** Bate, March 1881.

Synonyms : Araeosternidae De Man, July 1881, Notes Leyden Museum, 3:137.

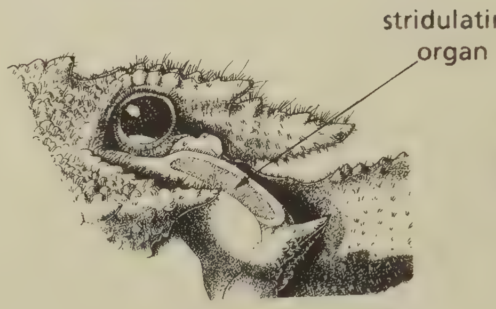
Type Genus: ***Araeosternus*** De Man, July 1881.

This family consists of two genera and a total of three species.

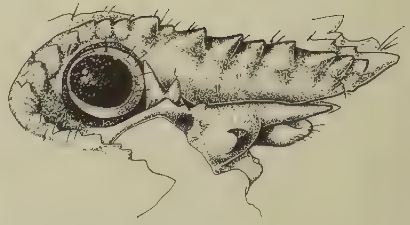
Key to Genera :

1a. Antennular plate with stridulating organ (Fig. 309a). Rostrum transversely oval, wider than long. Lateral margin of carapace with distinct teeth behind anterolateral tooth (Fig. 309b). Posterior margin of pleura of abdominal somites 2 to 5 with a deep and abrupt excavation near the top, most distinct in somites 4 and 5. Total length to 27 cm .... ***Palibythus***

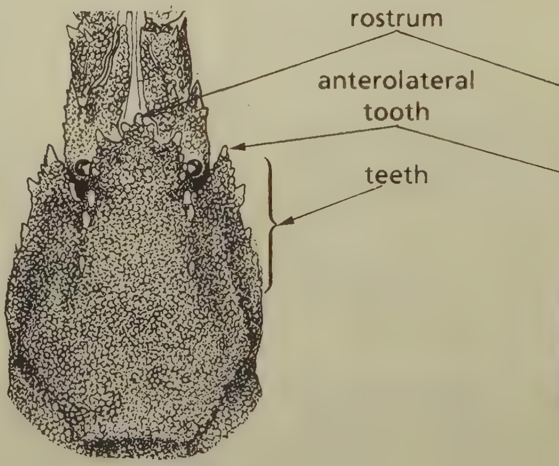
1b. Antennular plate without stridulating organ (Fig. 310a). Rostrum triangular, longer than wide. Lateral margin of carapace without teeth behind anterolateral tooth (Fig. 310b). Posterior margin of abdominal pleura evenly sinuously rounded, without a deep and sudden concavity near the top. Maximum known length 20 cm .... ***Palinurellus***



a. lateral view of orbital region and antennular plate
(from Davie, 1990)

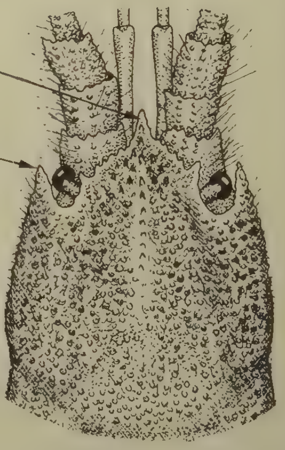


a. lateral view of orbital region and antennular plate
(from Davie, 1990)



b. anterior part of carapace (dorsal view)
(after Davie, 1990)

Palibythus Fig. 309



b. anterior part of carapace (dorsal view)

Palinurellus Fig. 310

Palibythus Davie, 1990

Palibythus Davie, 1990, Invertebrate Taxonomy, 4:685. Gender masculine.

Type Species : By original designation and monotypy: ***Palibythus magnificus*** Davie, 1990.

A single species is known of this genus.

Palibythus magnificus Davie, 1990

Fig. 311

SYNAX Palib 1

Palibythus magnificus Davie, 1990, Invertebrate Taxonomy, 4:685, 686, figs 1A,B, 3A,C, 4A, 5A.

FAO Names : En - Musical furry lobster.

Type : Type locality of ***Palibythus magnificus*** : "off coast of Savaii, Western Samoa, trapped ... 220-275 m". Female holotype, QM, no. W 16402, 2 female paratypes, QM, no. W 15941.

Geographical Distribution : Central Pacific: W. Samoa and Tuamotu Archipelago (Fig. 312).

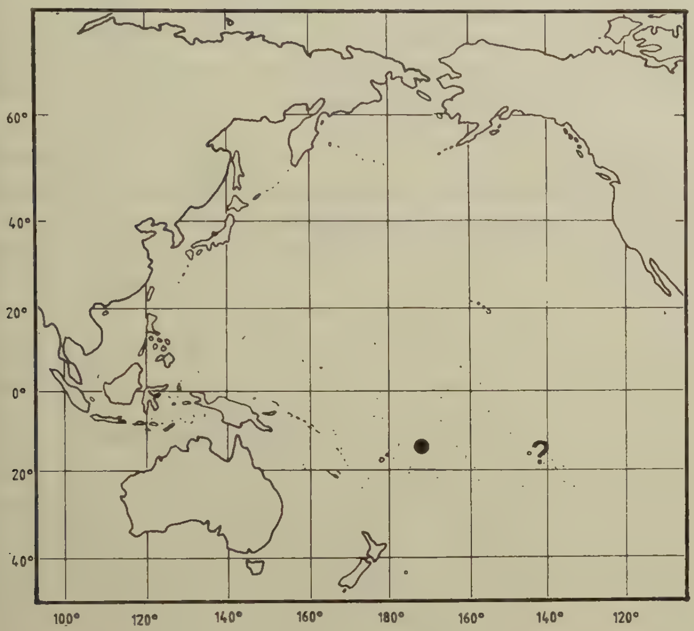
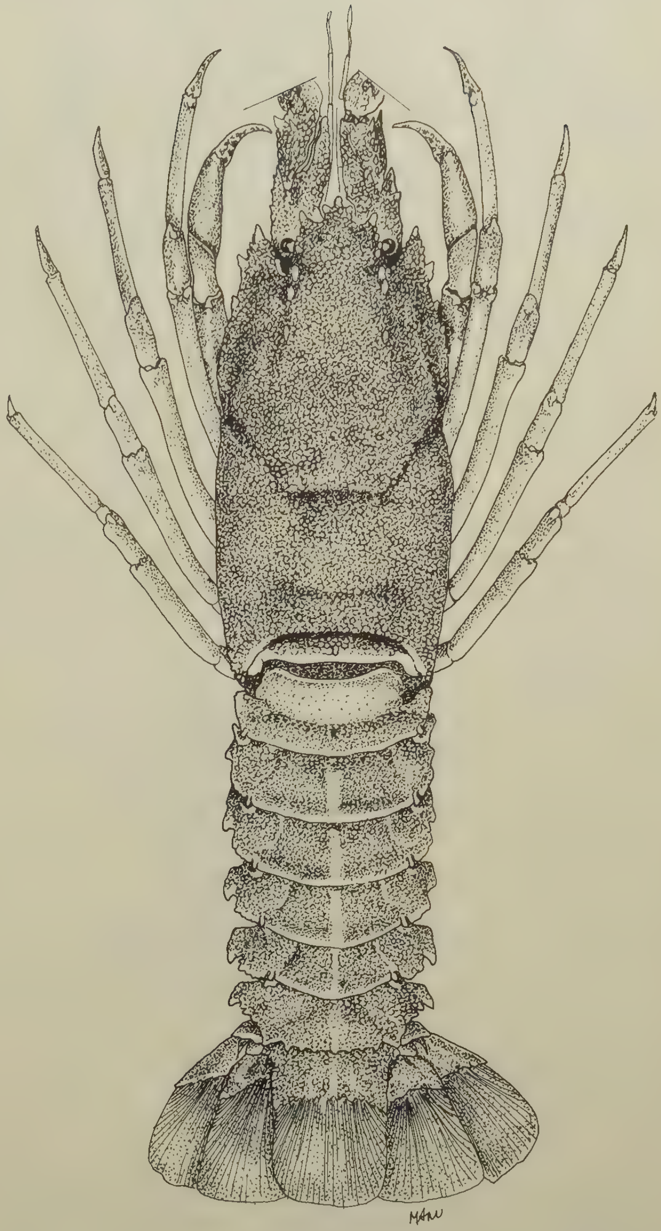


Fig. 312



(after Davie, 1990) Fig. 311

Habitat and Biology : Depth range between 220 and 300 m.

Size : Carapace length in females 13.1 to 13.7 cm, corresponding with a total length of about 27 cm. Males unknown.

Interest to Fisheries : So far none, as the species seems to be very rare and lives in deep water. The three females from Samoa were obtained in a fish trap, evidently during commercial or exploratory fishing.

Literature : Original description.

Remarks: The specimens from the Tuamotu Islands are only known from photographs, but were "almost definitely this species" (Davie, 1990:688).

Palinurellus Von Martens, 1878

SYNAX Pali

Palinurellus Von Martens, 1878, Sitzungsberichte Gesellschaft naturforschender Freunde, Berlin, 1878:131. Gender masculine. Name placed on the Official List of Generic Names in Zoology, in Opinion 519 (published in 1958).

Type Species: by monotypy: ***Palinurellus gundlachi*** Von Martens, 1878

Synonyms : ? ***Phyllamphion*** Reinhardt, 1849, Videnskabelige Meddelelser naturhistoriske Forening Kobenhavn, 1849-1850:2. Type species, by monotypy: ***Phyllamphion elegans*** Reinhardt, 1849. Gender masculine.

Synaxes Bate, 1881 (March), Annals Magazine Natural History, (5)7:228. Type species, by monotypy: ***Synaxes hybridica*** Bate, 1881 (March). Gender feminine.

Araeosternus De Man, 1881 (July), Notes Leyden Museum, 3:137. Type species, by monotypy: ***Araeosternus wieneckii*** De Man, 1881 (July). Gender masculine.

Two species are recognized in this genus, neither of commercial importance. If ***Phyllamphion*** is based on larvae of the present genus, which, in the light of recent investigations seems most likely, the generic name ***Phyllamphion*** is the oldest for the genus and therefore has to replace ***Palinurellus***.

The two species are very similar. Some of the alleged differences proved to be due to abnormalities (e.g., the shape of the rostrum in the holotype of ***P. wieneckii***), incorrect observations, or incorrect interpretation of the variability of characters. As both species are rather rare the study of larger series of specimens is necessary to clarify their taxonomic status.

Key to Species :

1a. Western Atlantic .. ***P. gundlachi*** (Fig. 313)

1b. Indo-West Pacific .. ***P. wieneckii*** (Fig. 315)

Palinurellus gundlachi Von Martens, 1878

Fig. 313

SYNAX Pali 1

Palinurellus gundlachi Von Martens, 1878, Sitzungsberichte Gesellschaft naturforschender Freunde, Berlin, 1878:131. Name placed on the Offical List of Specific Names in Zoology, in Opinion 519 (published in 1958).

Synonyms : ***Synaxes hybridica*** Bate, 1881; ? ***Phyllamphion reinhardti*** Belloc, 1959.

FAO Names : **En** - Caribbean furry lobster; **Fr** - Cacahouète caraïbe; **Sp** - Langostita del Caribe

Type : Type locality of ***P. gundlachi***: "an der Küste von Cuba, bei Camaricoia östlich von Matanzas". Holotype female in ZMB no. 5833, in alcohol, condition excellent.

Type locality of ***Synaxes hybridica***: "West Indies". Holotype female in NMI, dry but in reasonable condition (don. Sir F.L. McClintok).

Type locality of ***Phyllamphion reinhardti***: "entre la Pointe orientale de la Guadeloupe (Pointe des Châteaux) et le petit archipel situé dans le sud-est connu sous le nom de Petite-Terre". Holotype larva in MOM, at present not located.

Geographical Distribution : Western Atlantic: Bermuda, Bahama Islands, southern Florida, Yucatán, Caribbean Arc (Cuba to Barbados), Curaçao, N.E. Brazil (Pernambuco) (Fig. 314).

Habitat and Biology : Depth range from 1.5 to 35 m; found in rather inaccessible places among rock and coral. Rather scarce.

Size : Maximum total lenght about 15 cm.

Interest to Fisheries : Caugth by hand, and occasionally in traps, but of no interest to commercial fisheries.

Local Names : MARTINIQUE: Vraie langouste de métropole; USA: Copper lobster (Florida).

Literature : Fischer (ed.), 1978: vol. 6.

Remarks : There appears to be little doubt that the larvae described as ***Phyllamphion*** belong to the present genus. Should this be confirmed, the correct name of the present species must be ***Phyllamphion gundlachi*** (Von Martens, 1878).

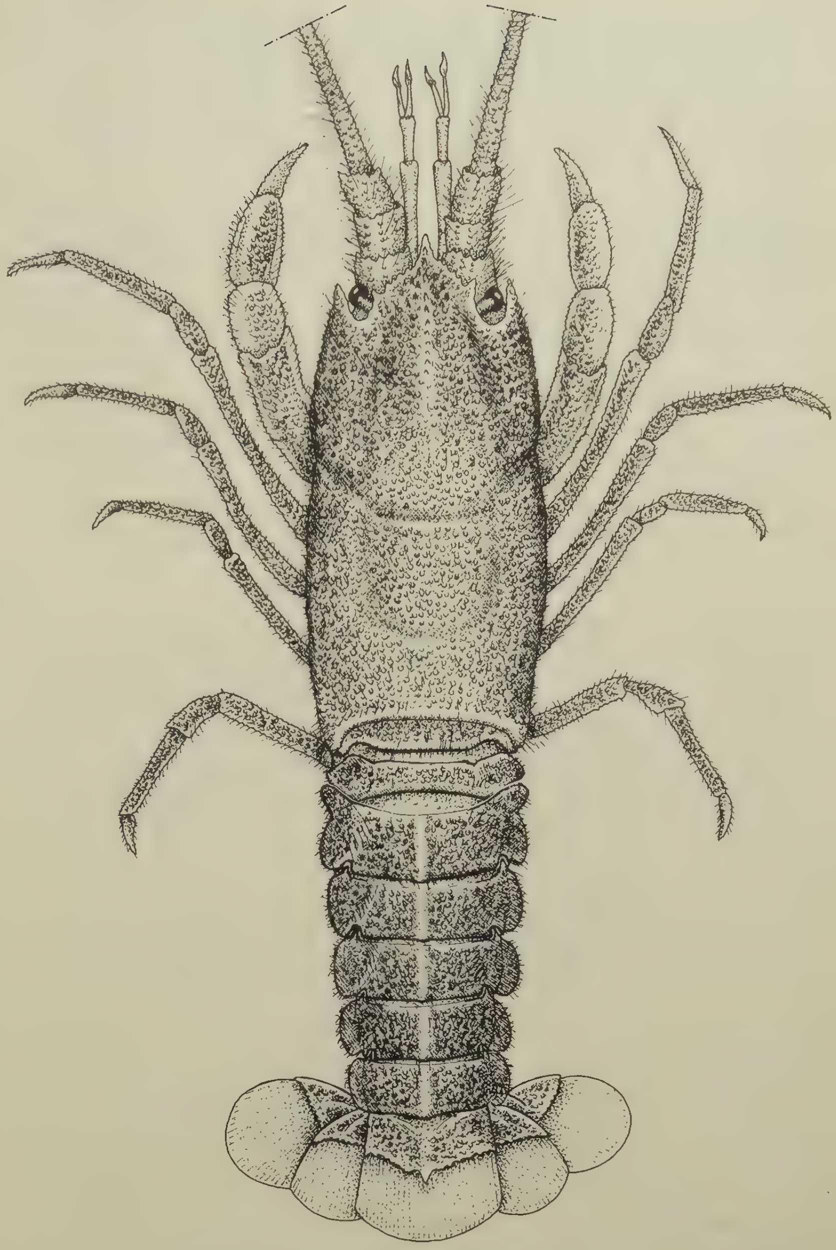


Fig. 313

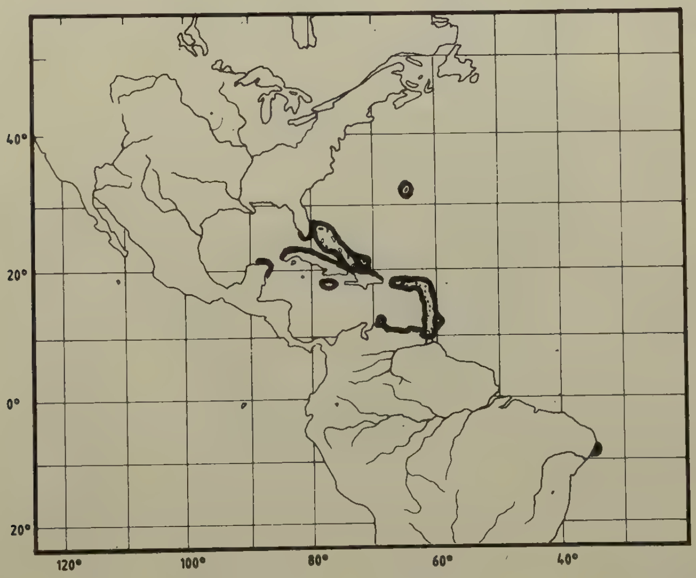


Fig. 314

Palinurellus wieneckii (De Man, 1881)

Fig. 315

Araeosternus wieneckii De Man, 1881, Notes Leyden Museum, 3:131.

Synonyms : ? ***Cancer cassideus*** Forster, 1782; ? ***Phyllamphion elegans*** Reinhardt, 1849; ***Palinurellus gundlachi wieneckii*** - Gruvel, 1911.

FAO Names : En - Indo-Pacific furry lobster; **Fr** - Cacahouète indopacifique; **Sp** - Langosta del Indo-Pacifico.

Type : Type locality of ***Cancer cassideus***: "Bewohnt das Indische Meer". "Habitat in Mari Indico" "Zwischen dem Vorgebürge der guten Hoffnung und Indien im grossen Ozean, dreihundert grosse Seemeilen weit von irgend einem Lande". Depository of types unknown.

Type locality of ***Phyllamphion elegans***: "har hjemme i det chinesiske Hav, hvor jeg dog kun en Gang har erholdt 3 Exemplarer, som fangedes met Slaebenaettet i nogle Miles Afstand fra Öen Luçon at Par Timer efter Solnedgang (d.11. Juni 1846)" (has its home in the Chinese Sea, where I once obtained 3 specimens caught with a drag net at several miles off the island of Luzon, a few hours after sunset on 11 June 1846). Depository of syntypes unknown.

Type locality of ***Araeosternus wieneckii***: "Rat-Island near Benkulen (Sumatra)" (= Pulau Tikus, S.W. coast of Sumatra, Indonesia, about 3°50'S 102°11'E) Holotype male in RMNH no. D 965.

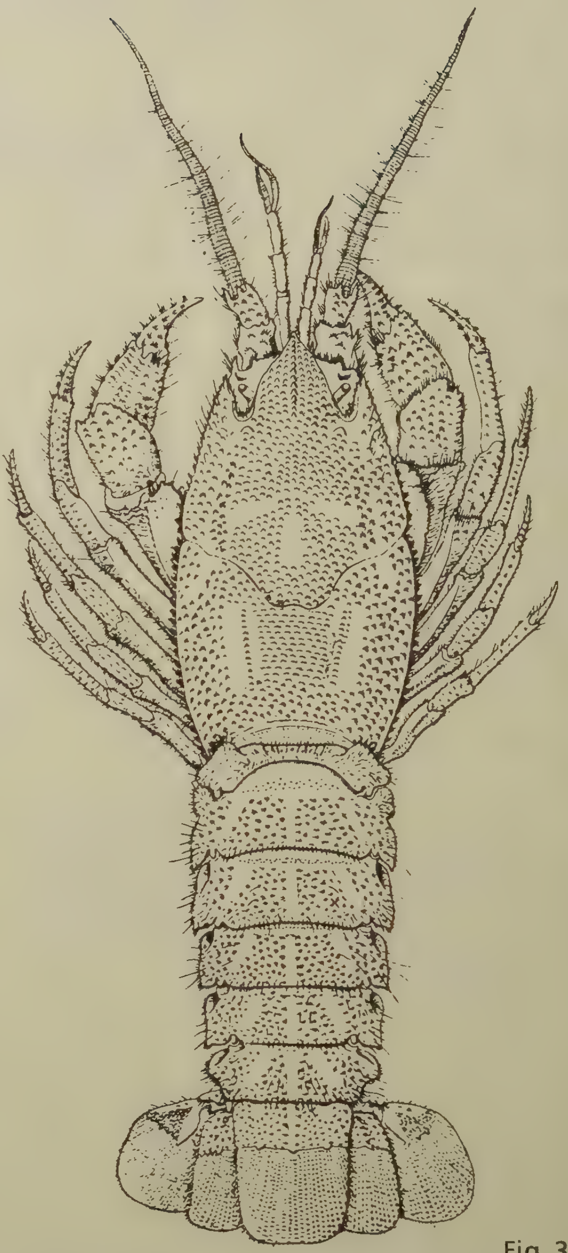


Fig. 315

Geographical Distribution : Indo-West Pacific region: Arabian coast of Red Sea, East Africa (larvae), South Africa (Natal, juvenile), western Indian Ocean (larvae), Mauritius, Thailand, (Phuket Island), Japan (Ryukyu Islands), Philippines (larvae), Indonesia (Sumatra, Borneo), New Guinea (Kiriwina Islands), Solomon Islands (Savo Id.), Caroline Islands (Ifaluk), New Caledonia (larvae and juveniles), New Hebrides (larvae), Hawaiian Islands (Oahu, Hawaii, Maui), Tuamotu Islands (larvae and juveniles) (Fig. 316).

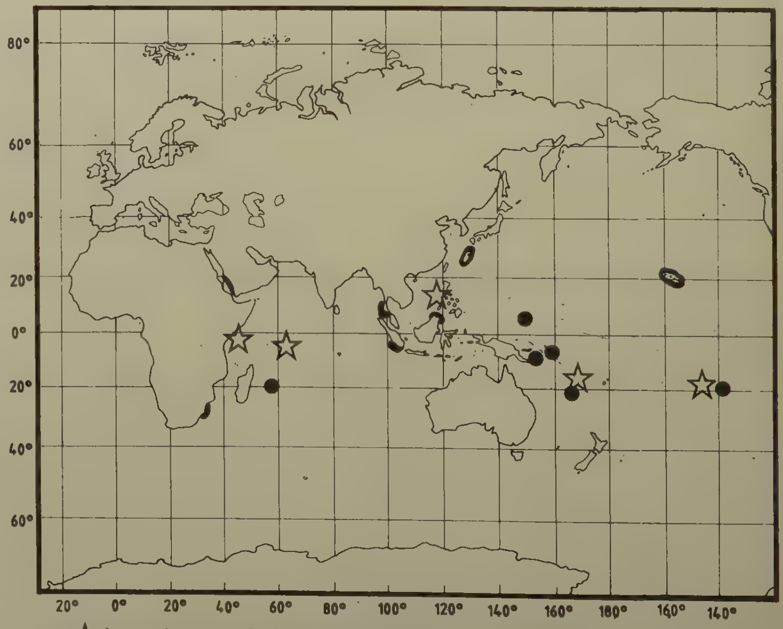
Habitat and Biology : In shallow water (from 9 to 27 m) on coral reefs and in marine caves. Probably nocturnal. Larvae planktonic.

Size : Maximum total body length about 20 cm, maximum carapace length about 8 cm. Body length usually around 10-14 cm.

Interest to Fisheries : Very slight at present: the species is taken only occasionally, being too rare for a commercial fishery. It is taken by hand and sometimes gets entangled in gill nets. It has caught the attention of the tropical marine aquarium trade, but is too infrequently taken to be of great economic value. The only specimen so far reported from Thailand, was offered for sale in a fancy glass case as a tourist souvenir.

Local Names : HAWAII: Mole lobster; MOZAMBIQUE: Lagosta peluda; THAILAND: Kung boran.

Literature : Fischer & Bianchi (eds), 1984:vol. 5.



☆larval records (supposedly of this species)

Fig. 316

Remarks: There appears to be little doubt that the larvae described as ***Cancer cassideus*** and ***Phyllamphion elegans*** are those of the present species. If this is confirmed, the name of the species should change to ***Phyllamphion cassideus*** (Forster, 1782).

2.2.5 FAMILY SCYLLARIDAE Latreille, 1825

SCYL

Scyllarides Latreille, 1825, Familles Naturelles du Règne Animal: 278. Name placed on the Official List of Family Names in Zoology, in Opinion 519 (published in 1958).

The family Scyllaridae includes 7 recent genera, which are distributed in 4 subfamilies: Arctidinae, Ibacinae, Scyllarinae, and Theninae. Except for most representatives of ***Scyllarus***, which are of no interest to fisheries, all species of Scyllaridae are treated in this catalogue.

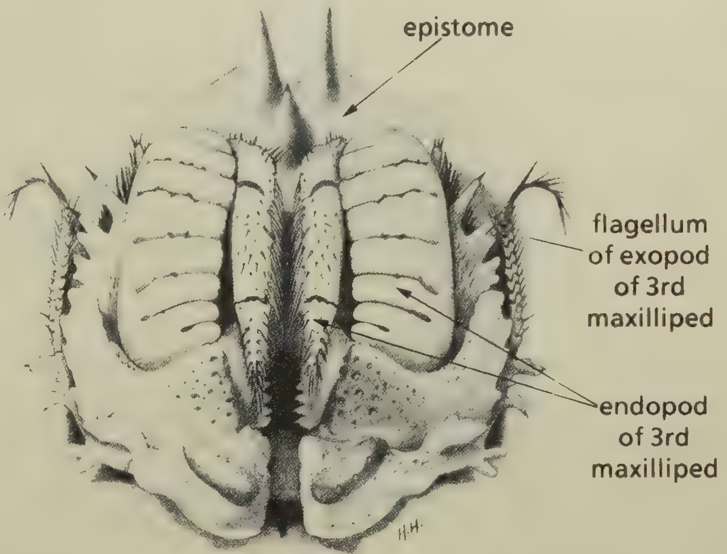
Key to Genera :

1a. Exopods of all maxillipeds with a multiarticulate flagellum (Fig. 317)

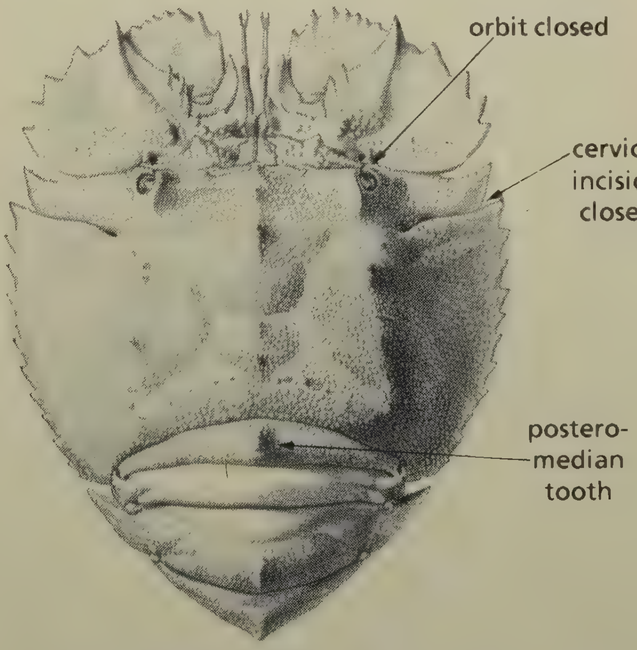
  2a. Carapace strongly depressed, with a deep cervical incision in the lateral margin. Mandible with a simple or two-segmented palp (subfamily Ibacinae)

    3a. Orbits entirely closed, placed behind the anterior margin of the carapace. Cervical incision closed. Carapace with a postero-median tooth. Fifth abdominal somite in the adults without postero-median spine. Body smooth and tuberculate. East Pacific (Fig. 318) .... ***Evibacus***

    3b. Orbits anteriorly open, placed on the anterior margin of the carapace. Cervical incision usually open, at least at the base. Carapace without posteromedian tooth (Fig. 319, 320). Atlantic and Indo-West Pacific


epistome
flagellum of exopod of 3rd maxilliped
endopod of 3rd maxilliped
H.H.

mouth region (ventral view) (from Holthuis, 1985) Fig. 317



Evibacus (dorsal view) (from Holthuis, 1985) Fig. 318

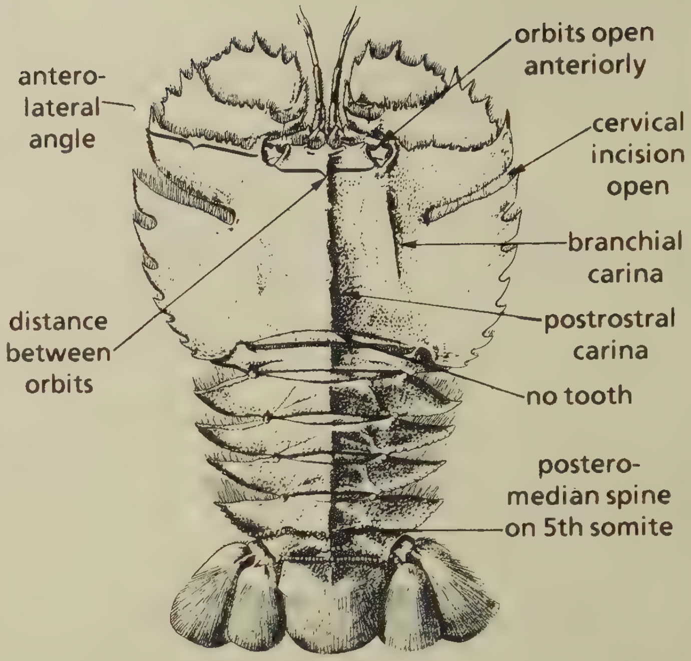
4a. Dorsal surface of the body smooth and punctate, not tuberculate, sometimes pubescent. Carapace with postrostral and branchial carinae distinct. Distance between the orbits as long as or shorter than the distance separating each orbit from the nearest anterolateral angle. Fifth abdominal somite with postero-median spine. Mandibular palp consisting of a single segment (Fig. 319) .... ***Ibacus***

4b. Dorsal surface of the body coarsely squamose-tuberculate, without postrostral or branchial carinae. Distance between the orbits more than twice as long as the distance between each orbit and the anterolateral angle of the carapace. Fifth abdominal somite without posteromedian spine. Mandibular palp two-segmented (Fig. 320) .... ***Parribacus***

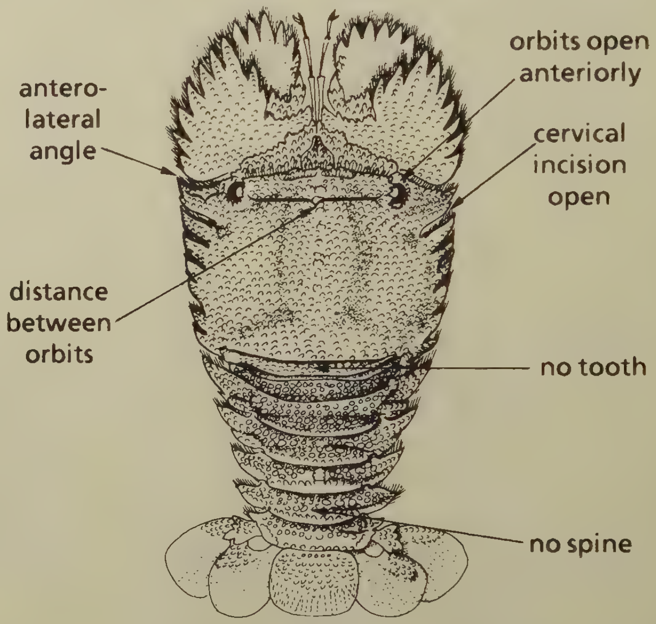
2b. Carapace rather highly vaulted, with a small, shallow cervical incision, which may be lacking altogether. Mandible with three-segmented palp (subfamily Arctidinae)

5a. First abdominal somite without a transverse groove dorsally; it is smooth there and shows a pattern of coloured spots. Carapace without postorbital spine. Apart from a median ridge, the abdomen shows no dorsal sculpturation (Fig. 321) .... ***Scyllarides***

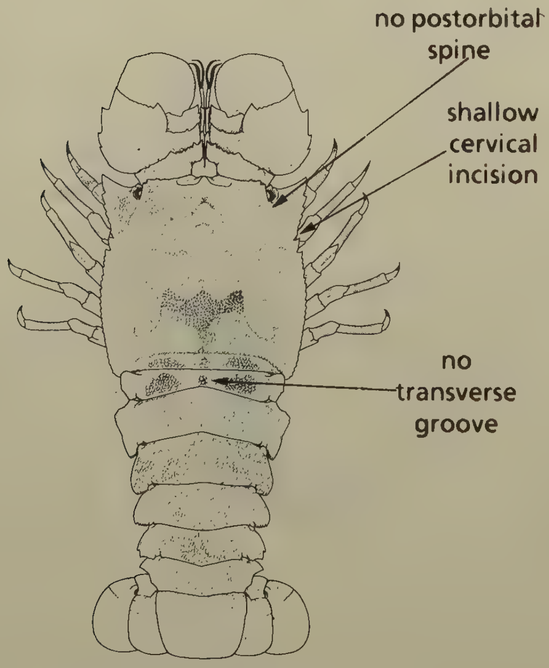
5b. First abdominal somite with a distinct transverse groove dorsally. Carapace with postorbital spine. Abdominal somites with a distinct sculpturation on either side of the median line (Fig. 322) .... ***Arctides***


antero-
lateral
angle
orbits open
anteriorly
cervical
incision
open
branchial
carina
distance
between
orbits
postrostral
carina
no tooth
postero-
median spine
on 5th somite

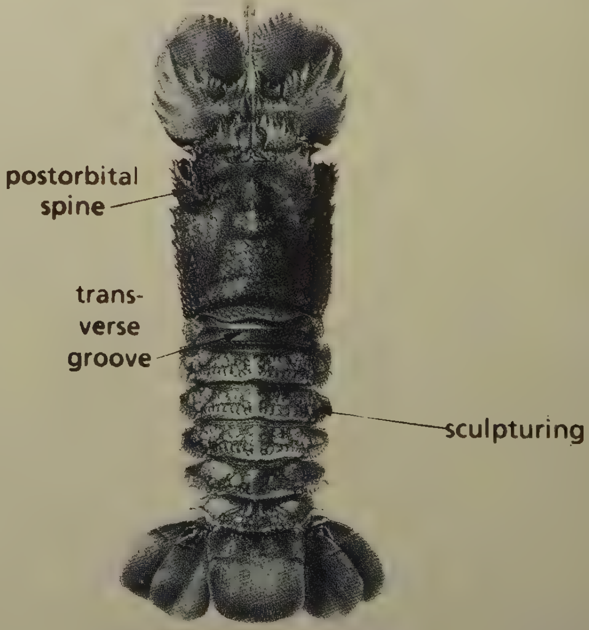
Ibacus (dorsal view) (from Holthuis, 1985) Fig. 319


orbits open
anteriorly
antero-
lateral
angle
cervical
incision
open
distance
between
orbits
no tooth
no spine

Parribacus (dorsal view) Fig. 320


no postorbital
spine
shallow
cervical
incision
no
transverse
groove

Scyllarides (dorsal view) Fig. 321

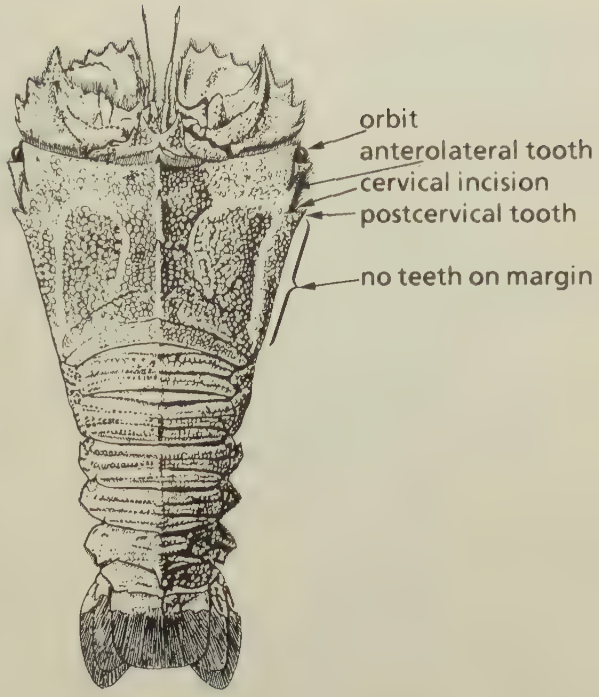

postorbital
spine
trans-
verse
groove
sculpturing

Arctides (dorsal view) Fig. 322

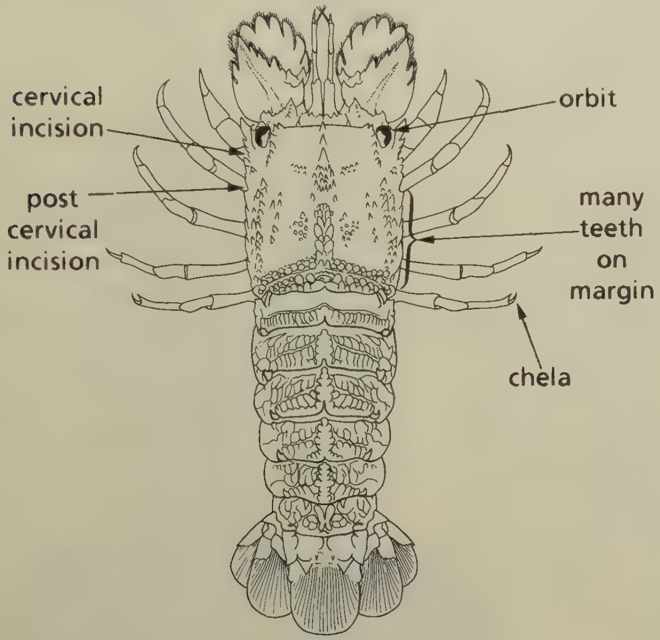
1b. Exopod of third and first maxilliped without a flagellum; the flagellum of the second maxilliped transformed to a single laminate segment

6a. Orbits on the anterolateral angle of the carapace. Body strongly depressed. Lateral margin of the carapace with only the cervical incision. No teeth on the lateral margin of the carapace, apart from the anterolateral and postcervical(Fig. 323). Fifth leg of female without a chela (subfamily Theninae) .... ***Thenus***

6b. Orbits on the anterior margin of the carapace, some distance from the anterolateral angle. Body not depressed, but rather high and vaulted. Lateral margin of the carapace with both cervical and postcervical incisions, neither of which is very deep. Lateral margin of the carapace with numerous teeth or squamiform tubercles. Fifth leg of female with a chela (Fig. 324) (subfamily Scyllarinae) .... ***Scyllarus***



Thenus (dorsal view) Fig. 323



Scyllarus (dorsal view) Fig. 324

SUBFAMILY **ARCTIDINAE** Holthuis, 1985

Arctidinae Holthuis, 1985, Zoologische Verhandelingen, Leiden, 218:10,11

The subfamily Arctidinae contains two genera, ***Arctides*** and ***Scyllarides***. The species of this subfamily are edible, but are caught only incidentally.

Arctides Holthuis, 1960

SCYL Arct

Arctides Holthuis, 1960, Proceedings Biological Society Washington, 73:154. Gender masculine.

Type Species: by original designation: ***Scyllarus guineensis*** Spengler, 1799.

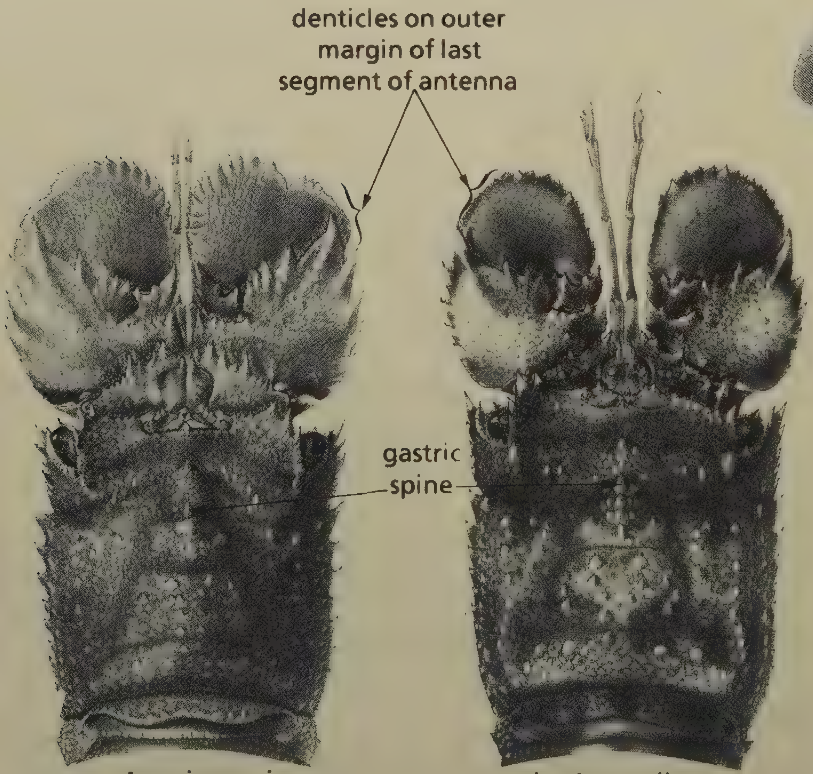
All three species of this genus are treated here. There is no great interest for any of them, as far as fishery is concerned.

Key to Species :

1a. Sculpturation of abdomen not very distinct, partly obscured by hairs and tubercles, hairy grooves betweeen naked portions wide. Median figures elongate and narrow, usually much elevated above surface of somites. Naked area along posterior margin of somite 2 to 5 occupying about 1/3 of the length of the posterior half of the somite (Fig. 325a). Legs more robust, propodus of second leg about three times as long as wide. No coloured bands on the legs. Dactylus and propodus of first and second legs purplish with small white spots. Larger species, carapace length up to more than 10 cm. Australasia .... ***A. antipodarum*** (Fig. 327)

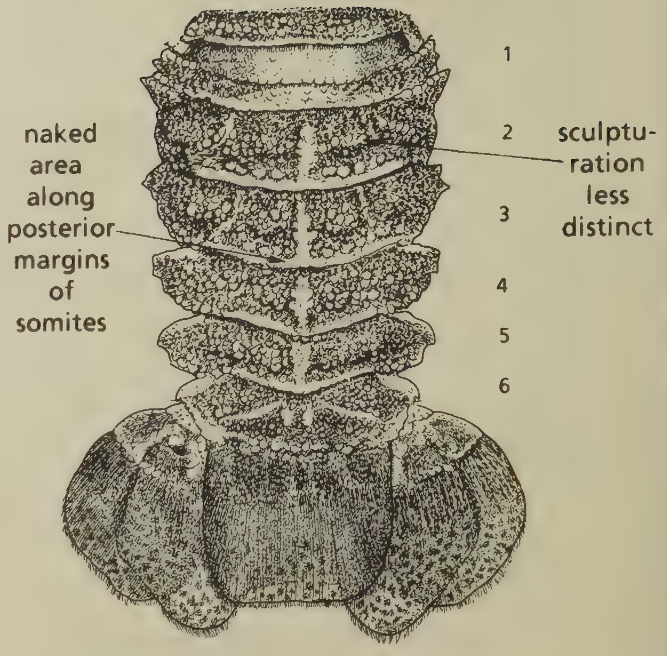
1b. Sculpturation of abdomen very distinct, the naked elevated parts distinct and separated by narrow hairy grooves. The median figures with broad lateral lobes. The naked area along posterior margin of somites 2 to 5 occupying almost half the length of the somites (Fig. 325b). Legs slender, propodus of second leg about 5 to 6 times as long as wide. Propodus, carpus and merus of second to fifth legs each with a coloured band. Smaller species, carapace length less than 7 cm.

- **2a**. Behind gastric spine of carapace two doubletopped spinules present. Denticles on outer margin of last segment of antenna smaller (Fig. 326a). Atlantic .... ***A. guineensis*** (Fig. 329)
- **2b**. Behind gastric spine a longitudinal row of three single spinules. Denticles on outer margin of last segment of antenna larger (Fig. 326b). Indo-West Pacific region .... ***A. regalis*** (Fig. 331)

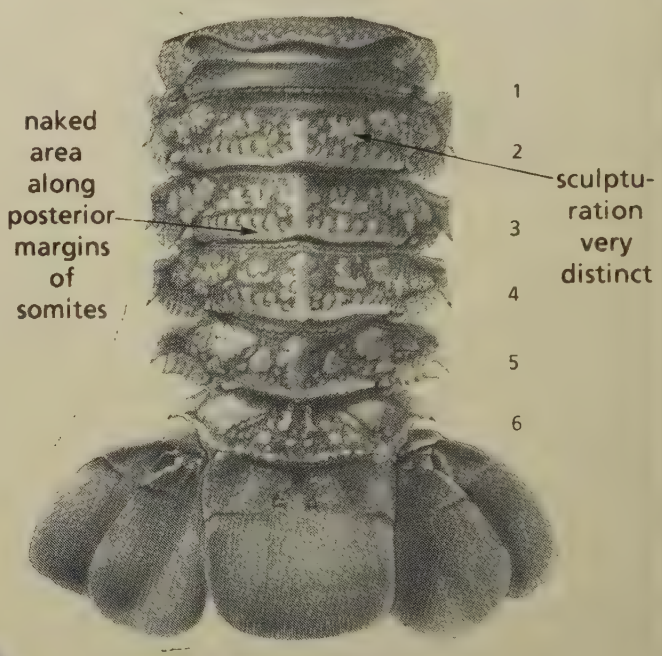

denticles on outer margin of last segment of antenna
gastric spine

a. ***A. guineensis*** b. ***A. regalis***

carapace (dorsal view) Fig. 326


naked area along posterior margins of somites
1
2
3
4
5
6
sculptu-ration less distinct

a. ***A. antipodarum***


naked area along posterior margins of somites
1
2
3
4
5
6
sculptu-ration very distinct

b. ***A. guineensis***

abdomen (dorsal view) Fig. 325

Arctides antipodarum Holthuis, 1960

Fig. 327

SCYL Arct 1

Arctides antipodarum Holthuis, 1960, Proceedings Biological Society Washington, 73:154.

FAO Names : En - Rough Spanish lobster.

Type : Type locality: "Off Malabar [= 27°35'S 152°35'E], New South Wales, Australia, depth 80 fathoms [= 146 m]". Holotype male in RMNH, No. D. 10648.

Geographical Distribution : East coast of Australia (New South Wales: Malabar, Port Stephens, Newcastle, Port Jackson), New Zealand (North Island: Hauraki Gulf) (Fig. 328). Michel (1971: 467, 471, 472) mentioned larvae from the New Caledonia-New Hebrides area and from the Tuamotu Archipelago that he assigned with some doubt to the present species. It is possible, however, that they actually belong to ***A. regalis***.

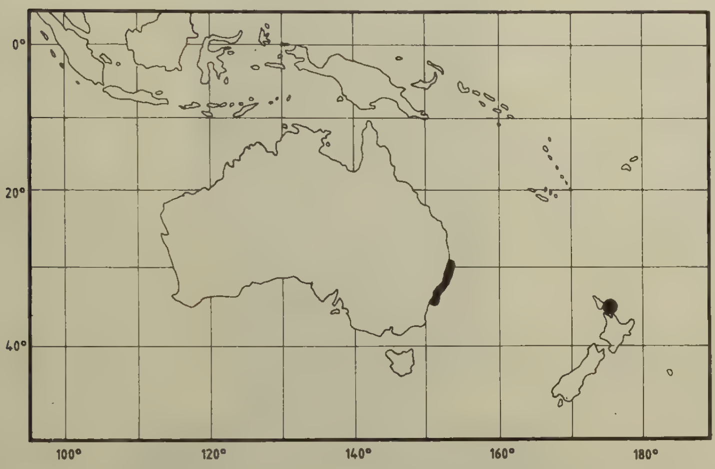


Fig. 328

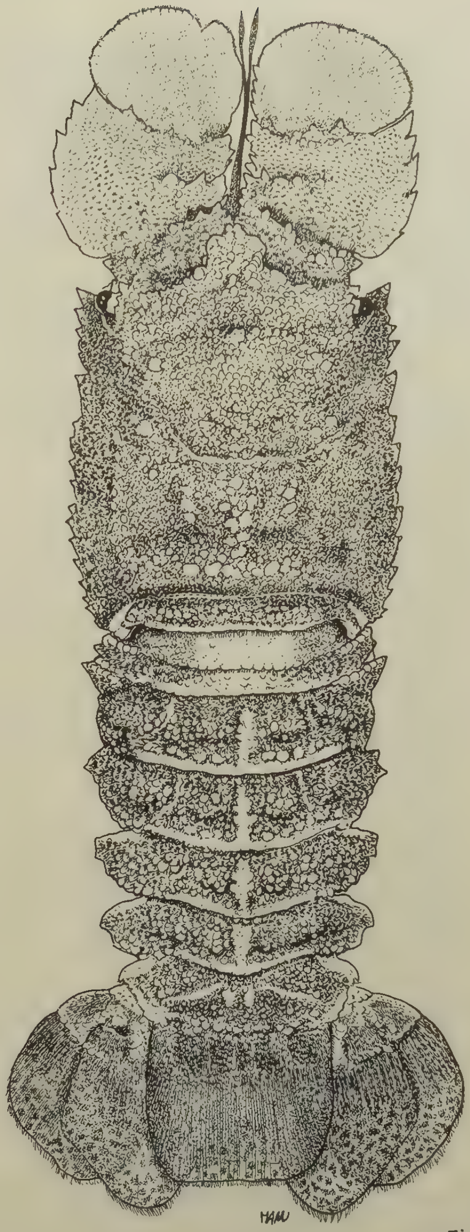


Fig. 327

Habitat and Biology : The species has been found in depths from 5 to 146 m, usually between 5 and 30 m; it seems to prefer clear water and rocky bottoms.

Size : Maximum total length about 30 cm, average carapace length 9 to 10 cm.

Interest to Fisheries : The species is sometimes caught in lobster traps set for species of ***Jasus***, and also is taken by hand by divers. The number of specimens caught, however, is so small that the species is of hardly any commercial interest notwithstanding that it is edible and of a reasonable size.

Local Names : AUSTRALIA: Red flapjack, Squat crayfish, Southern shovel-nosed cray, South-eastern shovel-nosed crayfish, South-eastern squat crayfish; NEW ZEALAND: Spanish lobster.

Arctides guineensis (Spengler, 1799)

Scyllarus guineensis Spengler, 1799, Kongelige Danske Videnskabers Selskab Skrifter (n.ser.) 5:333, pl. 1.

Synonyms: ***Scyllarus sculptus*** Latreille, 1818; ***Scyllarides sculptus bermudensis*** Verrill, 1922; ***Scyllarides sculptus*** - Chace, 1937; ***Scyllarides guineensis*** - Holthuis, 1946.

FAO Names : En - Small Spanish lobster.

Type : Type locality of ***S. guineensis***: "Dens Faedreneland er Kysten af Guinea" (= Its fatherland is the coast of Guinea, West Africa). As the species never, before or since, has been reported from West Africa and it is rather frequently met with in the West Indies, there is some doubt about the correctness of the type locality indication. Holotype male in UZM, now lost (not located in 1989).

Type locality of ***S. sculptus***: none of the early publications dealing with the type gives any indication of its locality. The dry holotype in MP (no. Pa. 964, in good condition); bears the inscription "Méditerranée" which most likely is incorrect.

Type locality of ***S. sculptus bermudensis***: "Bermuda"; syntypes in YPM, no. 814 (not located in 1989), and USNM (no. 21608).

Geographical Distribution : Western Atlantic: Bermuda, Florida, Bahama Islands, Martinique. Larvae have been collected in the "Bermuda triangle" area (Bermuda, the coast of USA from N. Carolina to S. Florida, the Bahamas and north of Puerto Rico) (Fig. 330).

Habitat and Biology : The species is found on the outer reefs. The larvae are planktonic.

Size : Total body length up to about 20 cm, carapace length about 4 to 6 cm.

Interest to Fisheries : The species is too rare to be of much economic interest. Most specimens known so far have been taken in lobster pots set for other species.

Local Names : BERMUDA: Small Spanish lobster.

Literature : Verrill, 1922:30-31, pl. 7 fig. 1. For larval development see Robertson, 1969:143-151.

Fig. 329

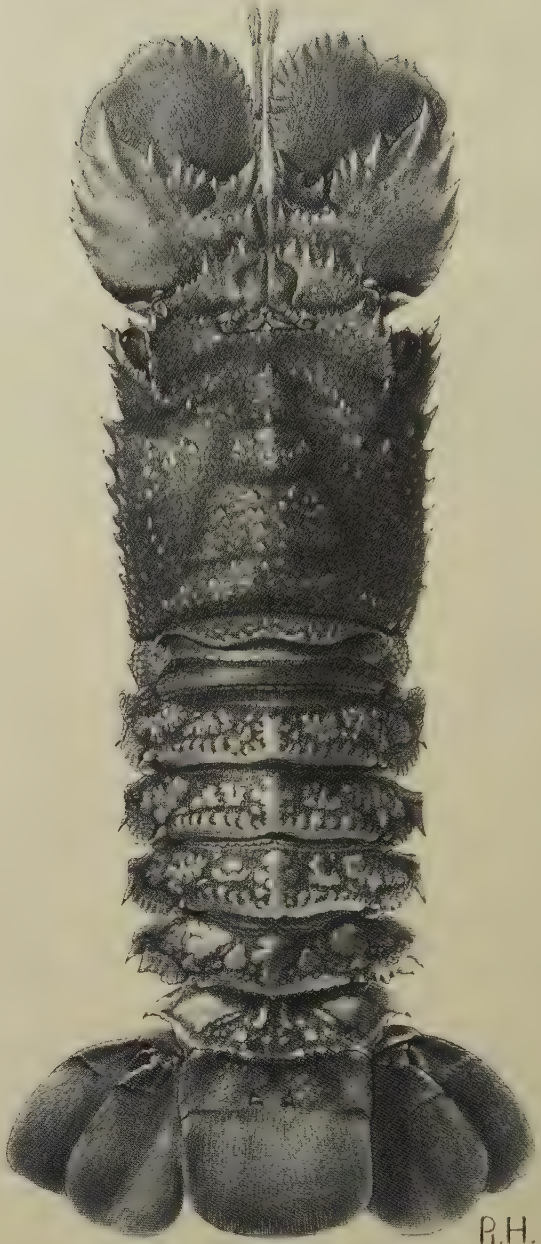


Fig. 329

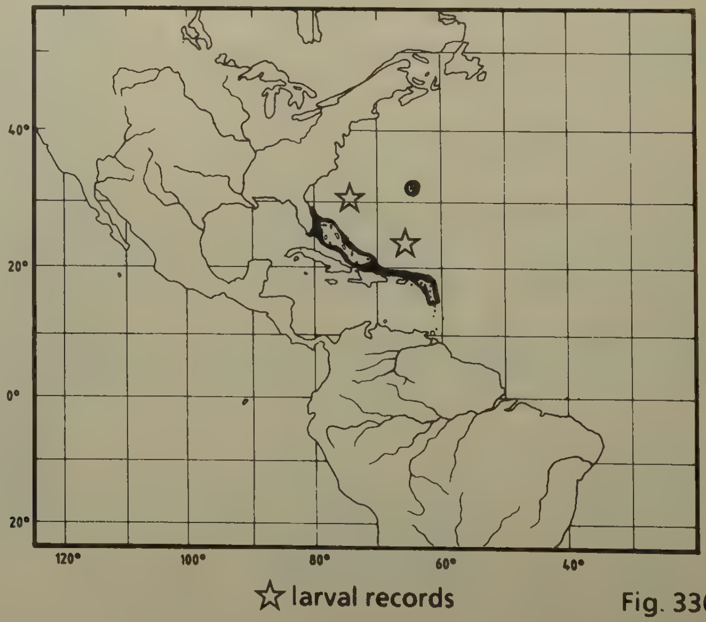


Fig. 330

Arctides regalis Holthuis, 1963

Fig. 331

SCYL Arct 3

Arctides regalis Holthuis, 1963, Proceedings Koninklijke Nederlandse Akademie Wetenschappen, (C) 66:58.

FAO Names : **En** - Royal Spanish lobster.

Type : Type locality: "reef near Coconut Island, Kaneohe Bay, Oahu, Hawaii". Holotype male in RMNH, no D. 17700.

Geographical Distribution : Indo-West Pacific region: western Indian Ocean (Mauritius, Réunion), New Caledonia, Hawaiian Islands, Easter Island. Johnson (1971:98, fig. 88-92) described larvae from east of Johnston Island. The larvae reported by Michel (1971:467) from the New Caledonia-New Hebrides area and from the Tuamotu Islands as ***A. antipodarum***, might well belong to the present species (Fig. 332).

Habitat and Biology : Depth range from 5 to 50 m; it is found on the outer edges of coral reefs. The animals are nocturnal and hide in the daytime in cavities in the rocks. They seem to be scavengers and feed on detritus.

Size : Total body length up to 17 cm; carapace length about 1.5 to 6 cm.

Interest to Fisheries : Minor, as the species is so rare and difficult to obtain. Therefore it is of little importance as food. But the aquarium trade has discovered that "when imported, their bright colours (for a slipper lobster) and unusual form make them popular and expensive novelties" (1984, Tropical Fish Hobbyist, 32(6):6).

Local Names : HAWAII: Royal slipper lobster, King's Hawaiian lobster, Shovel-nosed lobster, Spanish lobster, Ula-pápapa.

Literature : Tinker, 1965:46, pl. 11.

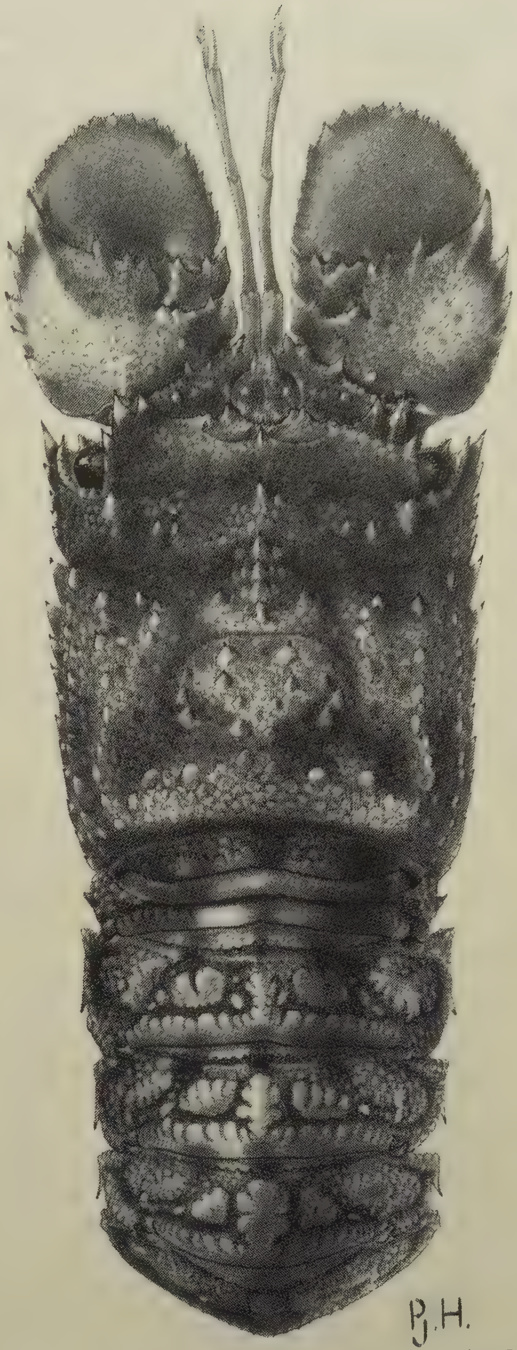
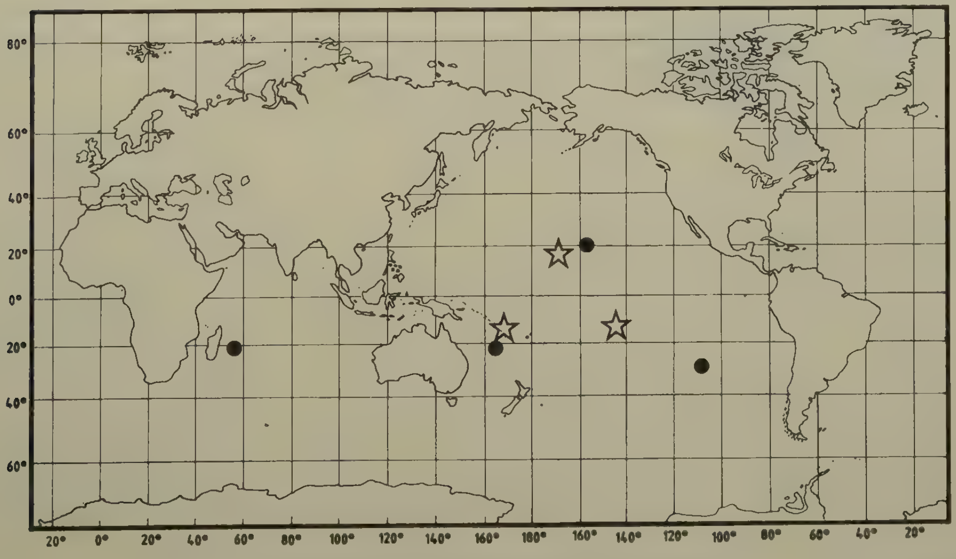


Fig. 331



☆larval records, probably of this species

Fig. 332

Scyllarides Gill, 1898

SCYL Scyld

Scyllarides Gill, 1898, Science, New York (n.ser.) 7:98. Gender masculine. Name placed on the Official List of Generic Names in Zoology, in Opinion 293 (published in 1954).

Type Species: by original designation: ***Scyllarus aequinoctialis*** Lund, 1793.

Synonyms: ***Pseudibacus*** Guérin-Méneville, 1855, Revue Magasin Zoologie, (2)7:137. Type species, by monotypy: ***Pseudibacus veranyi*** Guérin-Méneville, 1855 (= junior subjective synonym of ***Scyllarides latus*** (Latr.)). Gender masculine. Name suppressed by the International Commission on Zoological Nomenclature under its plenary power in Opinion 293 (published in 1954) and placed on the Official Index of Rejected and Invalid Names in Zoology.

Scyllaridia Bell, 1857, Monograph of the fossil malacostracous Crustacea of Great Britain, 1:35. Type species, by monotypy: ***Scyllaridia koenigi*** Bell, 1857. Gender feminine. Name suppressed by the International Commission on Zoological Nomenclature under its plenary power in Opinion 293 (published in 1954) and placed on the Official Index of Rejected and Invalid Names in Zoology.

At present 13 species of the genus ***Scyllarides*** are known. All are treated in the present catalogue. They attain a large size and are edible.

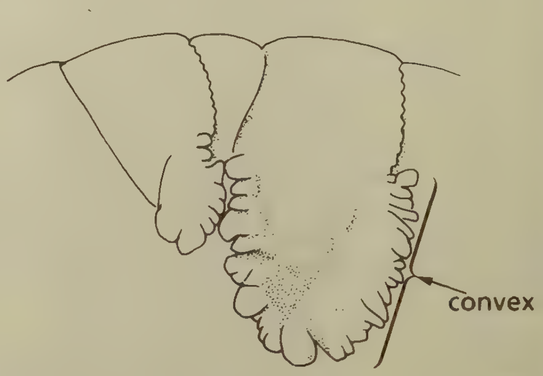
Key to Species :

1a. Outline of the posterior margin of the pleura of the second abdominal somite straight or evenly convex (Fig. 333)

   2a. Lateral margin of carapace with distinct cervical and postcervical incisions. Anterior margin of the carapace between the eye and the anterolateral angle evenly concave (Fig. 334). South Africa .... ***S. elisabethae*** (Fig. 357)

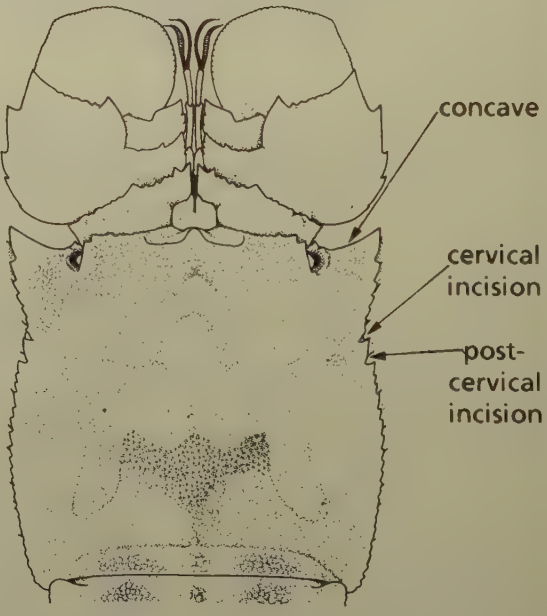
   2b. Lateral margin of carapace with a cervical incision only. Anterior margin of carapace between the eye and the anterolateral angle convex or sinuous

      3a. Inner orbital margin evenly tuberculate with 3 or 4 rounded tubercles. Lobe of inner orbital angle not touching the outer angle. Grooves of carapace rather indistinct. Gastric tooth not distinguishable from the other tubercles of the area. First abdominal somite with only two red spots (the laterals), the median spot being absent (Fig. 335a). Median carinae on abdominal somites hardly noticeable. Western Atlantic .... ***S. brasiliensis*** (Fig. 351)



lateral view of pleuron of 2nd abdominal somite
S. brasiliensis
(from Williams, 1986)

Fig. 333



carapace (dorsal view)
S. elisabethae

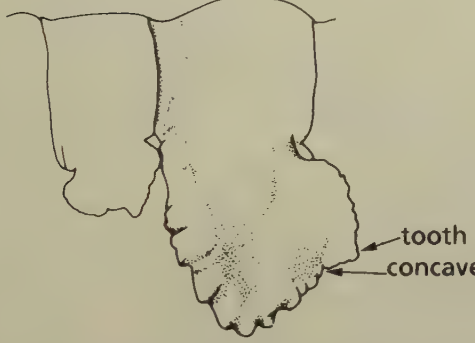
Fig. 334

3b. Inner orbital margin with two strong, pointed teeth, which are larger than any of the tubercles on that margin. Inner orbital angle with a toothed lobe which in adults practically touches the outer orbital angle and so closes the orbit. Grooves on the carapace distinct. First abdominal somite with three red spots, one rather ill-defined in the middle, and two more distinct laterally; seldom the three are fused to a single broad spot (Fig. 335b). Median carinae present on abdominal somites. Indo-West Pacific .... ***S. squammosus***
(Fig. 369)

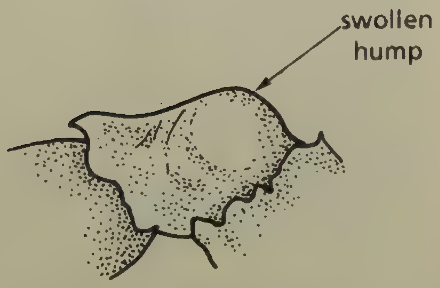
1b. Outline of the posterior margin of the pleura of the second abdominal somite concave in the middle through the presence of a strong tooth (Fig. 336)

4a. Carpus of first pereiopod with a large swollen hump in the upper basal part; a very shallow groove extends over this hump (Fig. 337). Western Atlantic

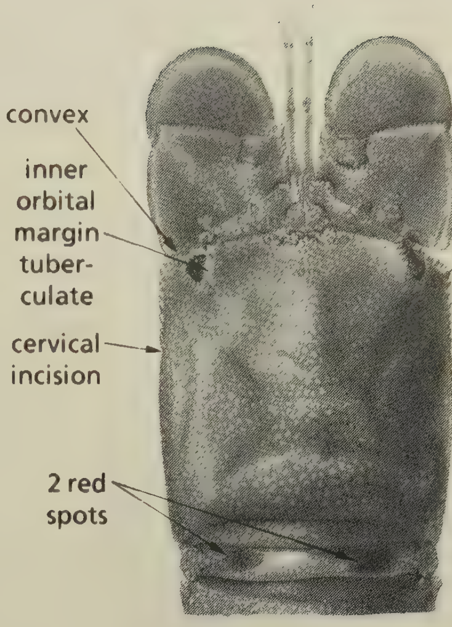
5a. Abdominal somites 2 to 4 with a very distinct broad elevated median carina, which is sharply set off from the rest of the surface. First abdominal somite with three distinct red spots. Tuberculation of carapace and abdomen coarse (Fig. 338a). Legs, even in specimens preserved for a long time in alcohol, with conspicuous sharply delimited red bands on propodus, merus and carpus .... ***S. nodifer***
(Fig. 365)


tooth
concave

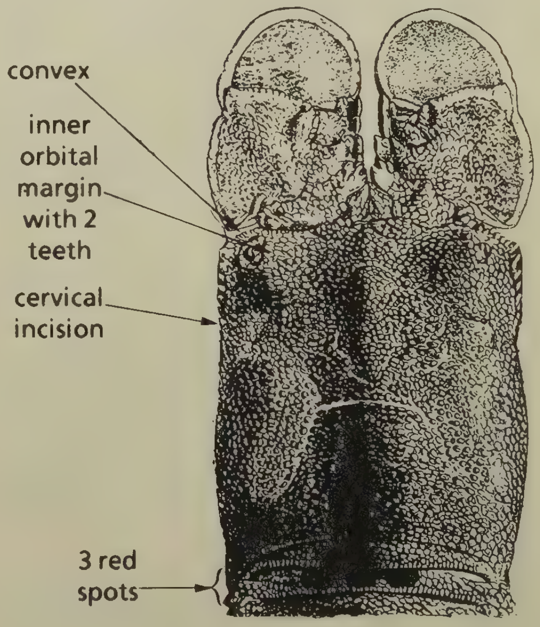
lateral view of pleuron of 2nd abdominal somite
S. deceptor Fig. 336
(from Williams, 1986)


swollen hump

carpus of first pereiopod
S. aequinoctialis Fig. 337


convex
inner orbital margin tuber-culate
cervical incision
2 red spots

a. ***S. brasiliensis***


convex
inner orbital margin with 2 teeth
cervical incision
3 red spots

b. ***S. squammosus***

carapace and first abdominal somite
(dorsal view) Fig. 335

5b. Abdominal somites without a broad elevated median ridge, although there may be an indication of a median longitudinal line (Figs 338b,c,d). Tubercles of carapace and abdomen low, hairs inconspicuous

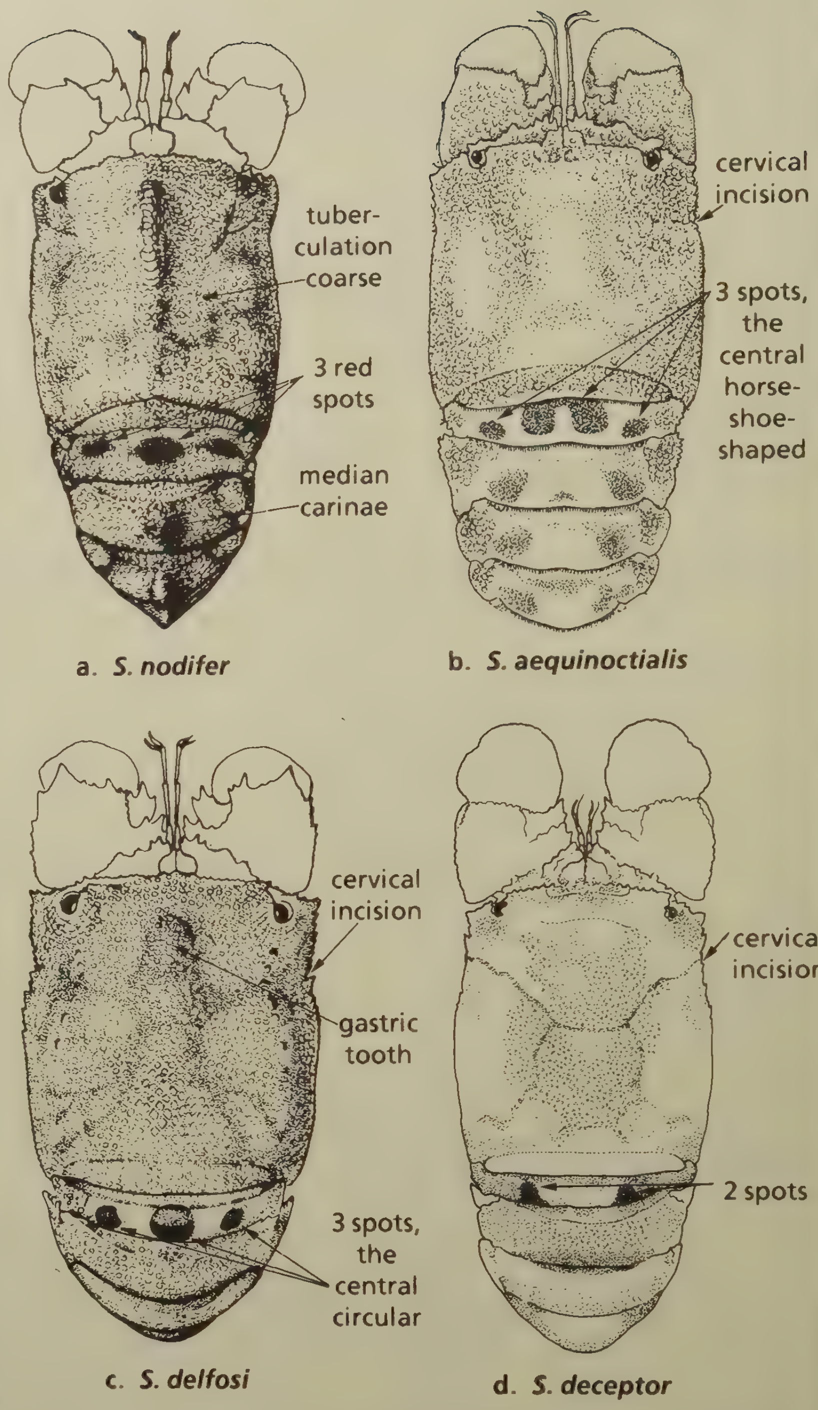
6a. Grooves on the carapace very inconspicuous. Pregastric and gastric teeth hardly if at all set off from the surface of the carapace. Cervical incision of the lateral margin hardly at all indicated. No indication at all of a median carina on the abdominal somites. Second abdominal sternite of male evenly denticulate, without a deeper median incision. First abdominal somite dorsally in the middle with a well defined horseshoe-shaped spot, consisting of two rounded submedian spots, which are connected anteriorly (Fig. 338b) .... ***S. aequinoctialis*** (Fig. 347)

6b. Grooves on the carapace distinct. Pregastric and gastric teeth well-defined. Cervical incision in lateral margin distinct and carapace constricted there. A faint elevated median line visible on abdominal somites 2 to 5. The sternite of the second abdominal somite in the male serrate, with the median incision usually deeper than the rest. No horseshoe-shaped coloured figure on the first abdominal somite (338c,d)

7a. First abdominal somite with a circular central spot and two irregular lateral spots. The cervical incision is narrow and distinct though short (Fig. 338c). The epistome bears two tubercles between the inner teeth .... ***S. delfosi*** (Fig. 355)

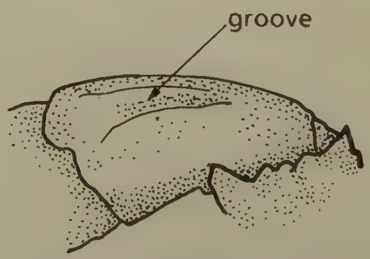
7b. First abdominal somite without a median spot but with two very distinct and sharply defined lateral spots. The cervical incision is wide and not very distinct (Fig. 338d). The epistome shows no tubercles or teeth between the two inner teeth ...... ***S. deceptor*** (Fig. 353)

4b. Carpus of first pereiopod with a distinct dorsal groove, and without a conspicuous basal swelling (Fig. 339). Eastern Atlantic, Indo-Pacific



a. ***S. nodifer*** b. ***S. aequinoctialis*** c. ***S. delfosi*** d. ***S. deceptor***

carapace and anterior abdominal somites (dorsal view) Fig. 338



carpus of first pereiopod

S. latus Fig. 339

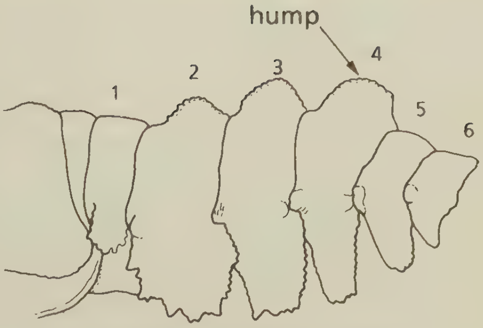
8a. Fourth abdominal somite in adult specimens produced into a very strong median hump which is about twice as high as those on the second and third somite (Fig. 340a). First abdominal somite with 2 distinct but rather small lateral spots and a large, less dark and irregular median spot (Fig. 340b) .... ***S. haanii*** (Fig. 359)

8b. Fourth abdominal somite of adult specimens not conspicuously higher than the third (Fig. 341)

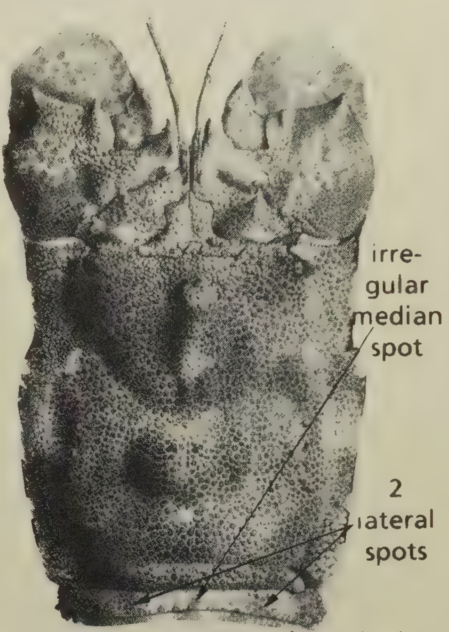
9a. Pleura of second abdominal somite ending in a sharp somewhat posteriorly directed point (Fig. 341). Eastern Atlantic

10a. Tubercles on the carapace high and conspicuous. Dorsal carinae of abdomen distinct and consisting of a row of pointed or blunt tubercles. Anterolateral tooth of fourth antennal segment hooked and twisted up out of the plane of the segment. Central spot on the first abdominal somite circular, separated by a narrow yellowish ringlike zone which surrounds the entire spot from the lateral spots, which are broadly triangular with the inner margin concave (Fig. 342a) .... ***S. latus*** (Fig. 363)

10b. Tubercles on the carapace low and blunt, entire sculpturation less pronounced and sharp than in ***S. latus***. Anterolateral tooth of fourth antennal segment although sometimes somewhat hooked, not twisted up. The first abdominal somite with three circular or irregular widely separated red spots (Fig. 342b) .... ***S. herklotsii*** (Fig. 361)

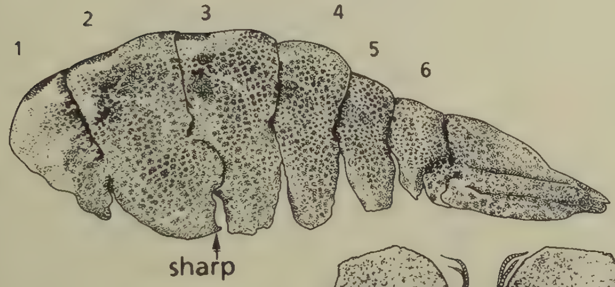

hump
1
2
3
4
5
6

a. abdomen (lateral view)

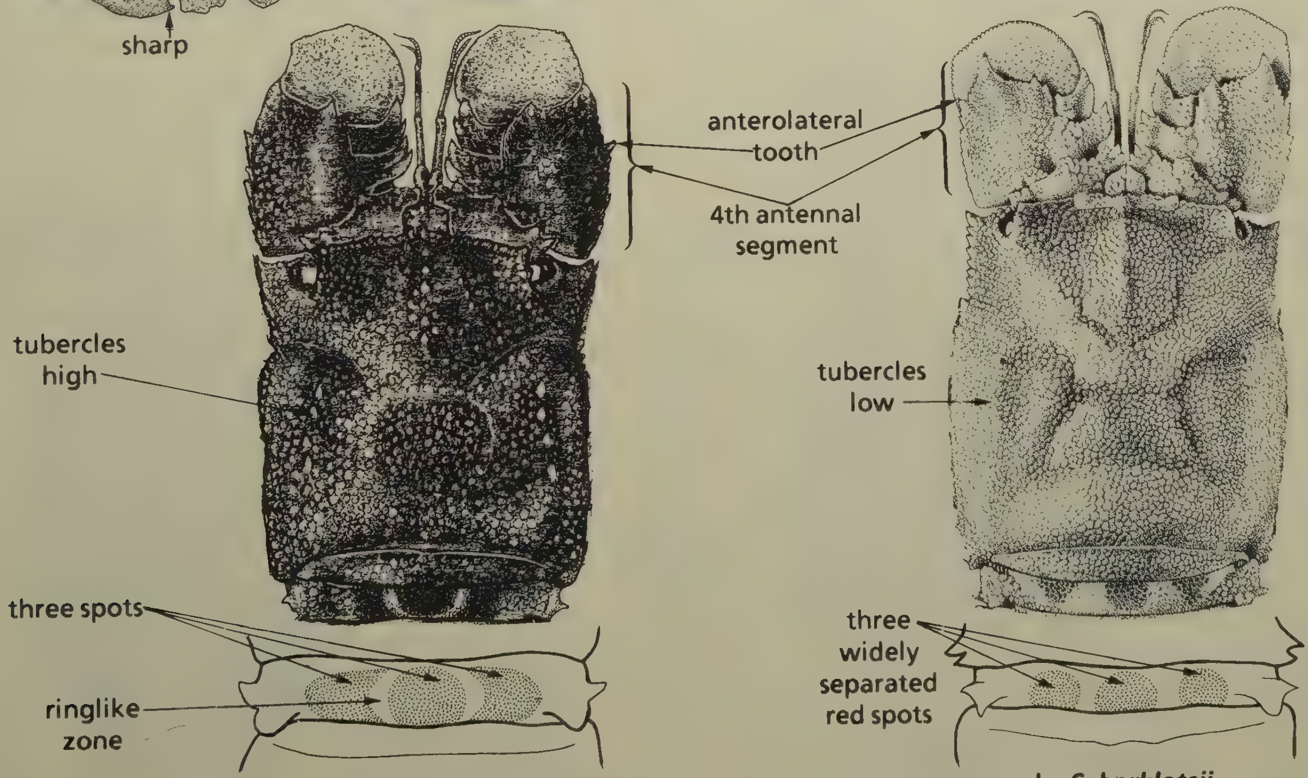

irre-
gular
median
spot
2
lateral
spots

b. carapace and first abdominal somite (dorsal view)

S. haanii Fig. 340


1
2
3
4
5
6
sharp

abdomen (lateral view) ***S. herklotsii*** Fig. 341


anterolateral
tooth
4th antennal
segment
tubercles
high
tubercles
low
three spots
ringlike
zone
three
widely
separated
red spots

a. ***S. latus*** **b.** ***S. herklotsii***

carapace and first abdominal somite (dorsal view) Fig. 342

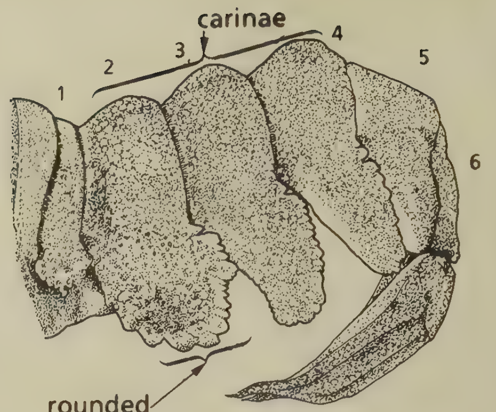
9b. Outline of pleura of second abdominal somite broadly rounded (Fig. 343). Indo-Pacific

11a. Gastric and pregastric teeth hardly noticeable, forming only faint broad elevations. No median carinae on abdomen. First somite of abdomen with two distinct lateral spots, between which numerous small spots, which in the median area are somewhat fused (Fig. 344). Eastern Pacific .... ***S. astori*** (Fig. 349)

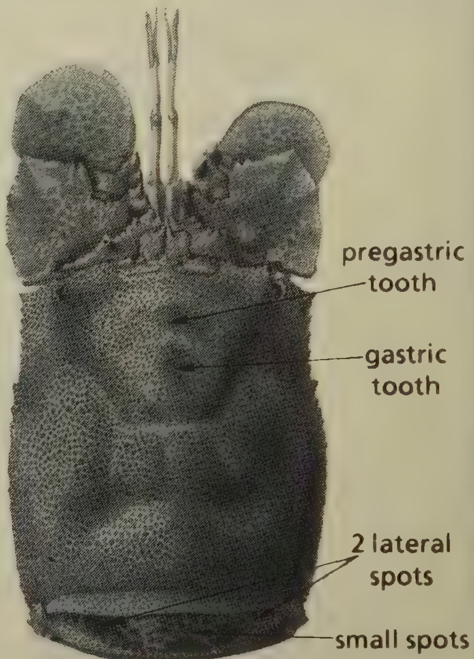
11b. Gastric and pregastric teeth distinct, well set off from the rest of the carapace. Abdominal somites 2 to 4 with median carinae (Fig. 343). First abdominal somite with 3 distinct spots, the central sometimes of irregular shape (Figs 345,346)

12a. Cervical groove wide and deep in its median area, anterior margin of cardiac knob thereby high. Pregastric tooth with a single tip. Median ridges on the second to fourth abdominal somites more in the shape of humps, gradually merging with the rest of the surface. Central spot on first abdominal somite very indistinct, the laterals distinct (Fig. 345) (Easter Island) .... ***S. roggeveeni*** (Fig. 367)

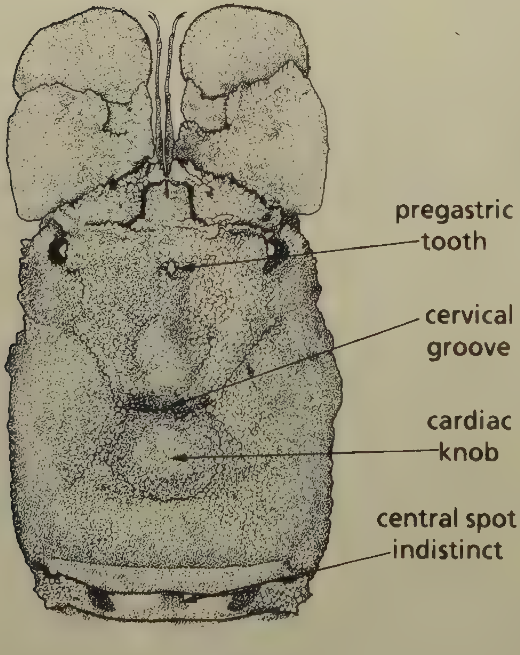
12b. Cervical groove narrow and shallow in its median area; the cardiac knob thereby very little pronounced. Pregastric tooth distinctly two-topped. Median ridges on second to fourth abdominal somite sharp and distinctly set off from the rest of the surface. Central spot on first abdominal somite sharply defined, as distinct as the laterals (Fig. 346) .... ***S. tridacnophaga*** (Fig. 371)


carinae
1
2
3
4
5
6
rounded

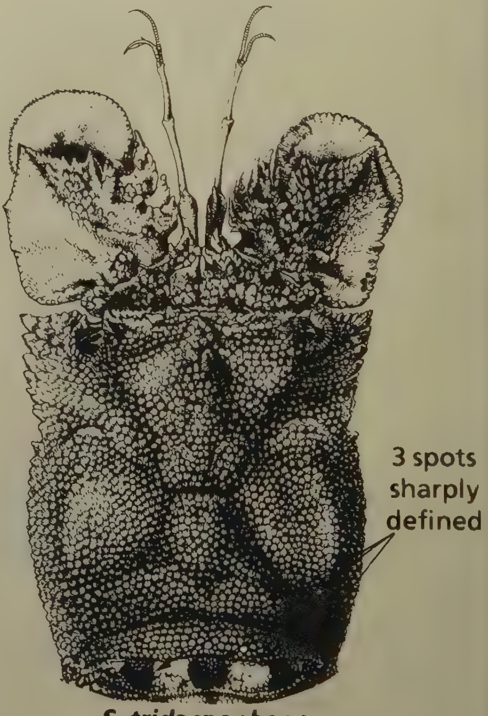
abdomen (lateral view)
S. roggeveeni
Fig. 343


pregastric tooth
gastric tooth
2 lateral spots
small spots

S. astori (dorsal view) Fig. 344
carapace and first abdominal somite


pregastric tooth
cervical groove
cardiac knob
central spot indistinct

S. roggeveeni
carapace and first abdominal somite
(dorsal view)
Fig. 345


3 spots sharply defined

S. tridacnophaga
carapace and first abdominal somite
(dorsal view)
Fig. 346

Scyllarides aequinoctialis (Lund, 1793)

Fig. 347

SCYL Scyld 2

Scyllarus aequinoctialis Lund, 1793, Kongelige Danske Videnskabers Selskab Skrifter, (n.ser.) 2(2):21. Name placed on Official List of Specific Names in Zoology, in Opinion 293 (published in 1954).

Synonyms: ***Pseudibacus gerstaeckeri*** Pfeffer, 1881.

FAO Names : En - Spanish slipper lobster; **Fr** - Cigale marie-carogne; **Sp** - Cigarra español.

Type : Type locality of ***S. aequinoctialis***: "seldom seen in Jamaica, though a native of those seas" (Browne, 1765:424). The male specimen figured by Browne (pl. 41 fig. 1) is chosen as the lectoptype of Lund's species; its present whereabouts are unknown.

Type locality of ***Parribacus gerstaeckeri***: "Atlantischer Ocean" Type material in ZMH.

Geographical Distribution : Western Atlantic, from S. Carolina (USA) and Bermuda via the West Indies to S. Brazil (São Paulo State), including the Gulf of Mexico and the Caribbean Sea (Fig. 348).

Habitat and Biology: Depth range from 0.6 to 180 m, usually between 0.6 and 64 m; on a substrate of sand or rocks, often on outer reefs. The animals are sluggish and nocturnal and feed on (dead) animals, detritus, etc. They bury themselves in the sand.

Size : Maximum total body length over 30 cm; carapace length up to about 12 cm.

Interest to Fisheries : The species is used as food, but is not of great economic importance; it is eaten mostly by the poorer people. Verrill (1922:23) remarked that it "is not commonly sold in the markets" at Bermuda, and "is rarely used as food there" Morice (1958:86) remarked that with ***Panulirus argus*** this species is the most common lobster in the market of Fort-de-France, Martinique. In Belize, the species "though occasionally caught, is never prepared for export and therefore is of no significance in the fishery" (Allsopp, 1968). Almost throughout its range ***S. aequinoctialis*** is eaten, but evidently not very highly esteemed. Its meat also serves as bait in lobsterpots. The animals are mostly taken in traps set for other species, but also with fixed gill nets and seines. It is sold fresh.

Local Names : BERMUDA: Locust lobster, French lobster, Long-tailed crab, Sea crayfish, Sea crawfish, Slipper lobster, Stump; BRAZIL: Lagostim, Cigarra, Fradinho, Lagosta sapateira; CUBA: Langosta de arena, Langosta española, Langostina; GRENADA: Lady crab; JAMAICA: Mother lobster, Turtle lobster; MARTINIQUE: Maman homard, Marie-carogne, Mère homard, Savate; NETHERLANDS ANTILLES: Beerkreeft, Schoenkreeft, Zandkreeft (Dutch; Aruba, Bonaire, Curaçao), Kreef zapatu (Papiamentu; Aruba, Bonaire, Curaçao); ST. THOMAS: Turtle lobster.

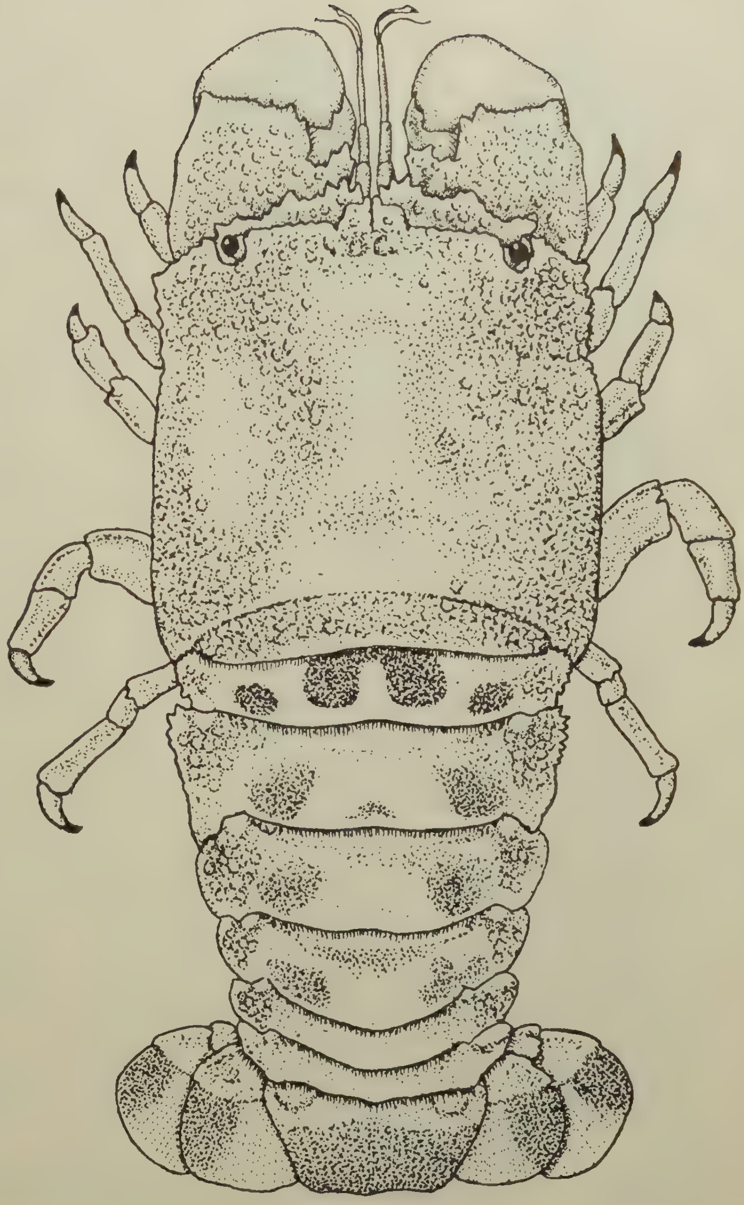


Fig. 347

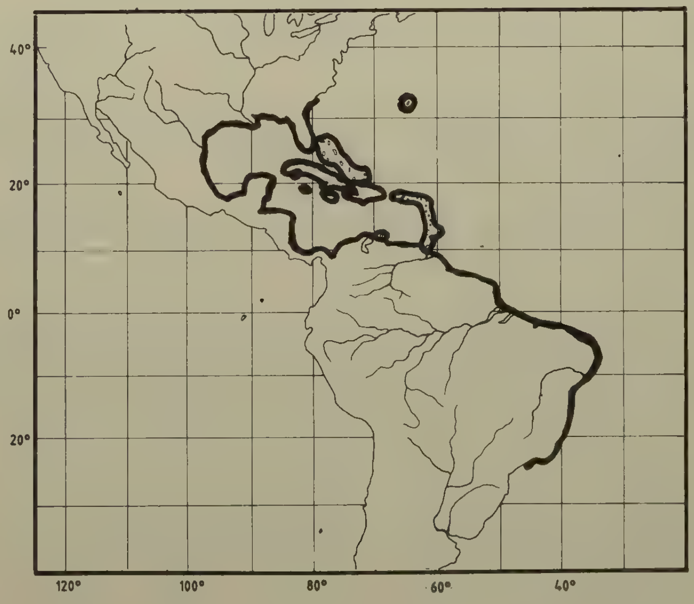


Fig. 348

Literature : Fischer (ed.), 1978: vol. 6; Williams, 1986:29, figs 62 (61 and 62 have been interchanged), 72, 80 l-m.

Scyllarides astori Holthuis, 1960

Fig. 349

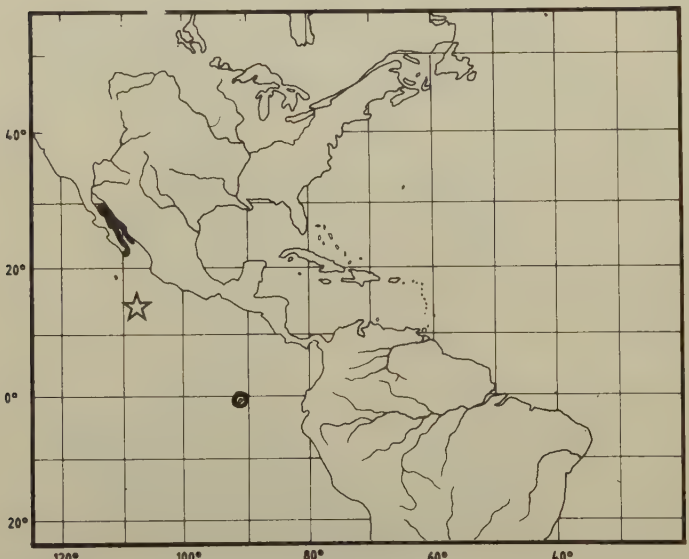
SCYL Scyld 7

Scyllarides astori Holthuis, 1960, Holthuis, Proceedings Biological Society Washington, 73:152.

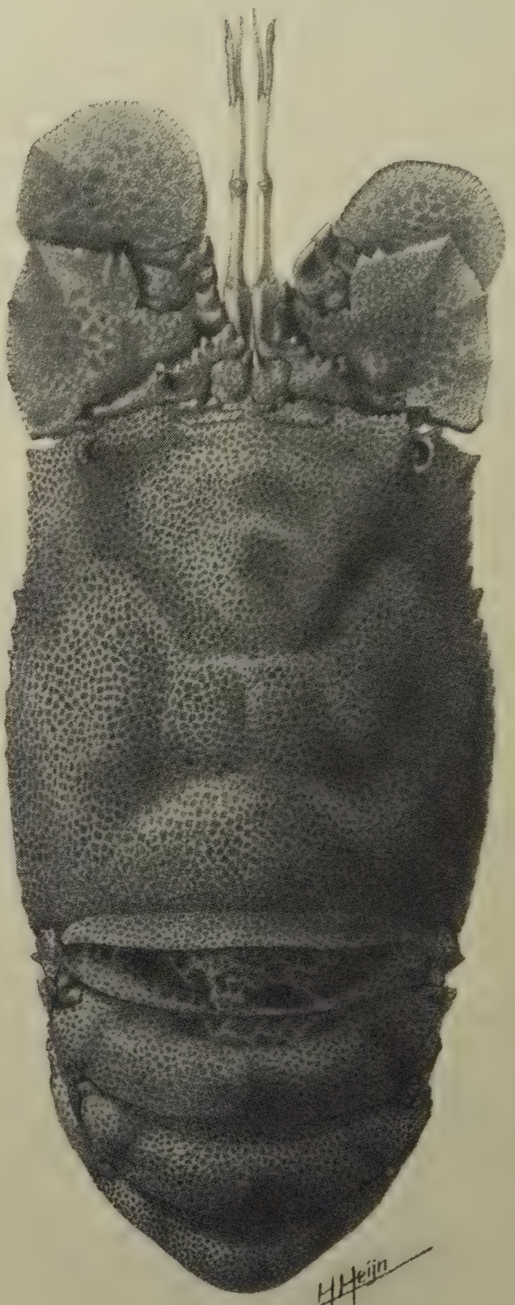
FAO Names : **En** - Galapagos slipper lobster; **Fr** - Cigale de Galapagos; **Sp** - Cigarro de Galápagos.

Type : Type locality: "Post Office Bay, Charles Island, Galapagos Archipelago". Holotype male in USNM, no. 104557.

Geographical Distribution : Eastern Pacific: Gulf of California, Mexico; Galápagos Archipelago, Ecuador. A larva probably of this species, at 200 miles N. of Clipperton Island (Fig. 350).



☆larval record (probably of this species)
Fig. 350



(from Holthuis & Loesch, 1967)

Fig. 349

Habitat and Biology : In shallow water, around 10 m; hardly any accurate depths are known. Probably on rocky substrate. Nocturnal.

Size : Total length up to about 25 cm; carapace length from 8 to 12 cm.

Interest to Fisheries : There is no special fishery for this species, but animals are occasionally caught in traps and trammel nets for spiny lobsters or other species. When caught the animals are used for food. Also the aquarium trade showed interest in this species, but it is caught too infrequently to be of economic importance.

Local Names : ECUADOR: Langostino (Galapagos Islands).

Literature : Holthuis & Loesch, 1967:216, pl. 7.

Scyllarides brasiliensis Rathbun, 1906

Fig. 351

SCYL Scyld 8

Scyllarides brasiliensis Rathbun, 1906, Proceedings Biological Society Washington, 19:113.

FAO Names : **En** - Brazilian slipper lobster.

Type : Type locality: "Bahia, Brazil". Holotype female in USNM, no. 21612.

Geographical Distribution : Western Atlantic region: Brazil (from Maranhão State to Bahia State). There is also a record from Dominica in the West Indies (Fig. 352).

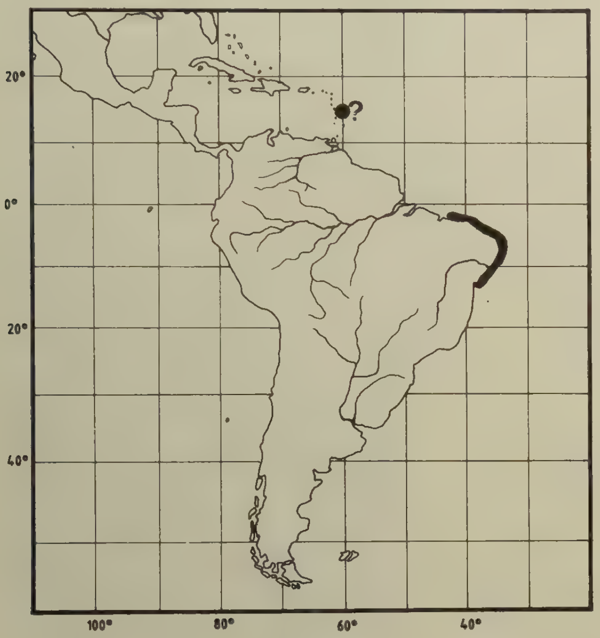


Fig. 352

Habitat and Biology : Depth range from 22 to 38 m. Very little is known about this species.

Size : Total body length to about 20 cm; carapace lengths 7.5 to 10 cm.

Interest to Fisheries : Fausto Filho et al. (1966) remarked that the species is of "alguma importancia econômica" in northern Brazil.

Local Names : BRAZIL: Sapateira, Lagosta japonesa, Lagosta sapateira.

Literature : Original description; Williams, 1986:27, figs 66,80 h-i.

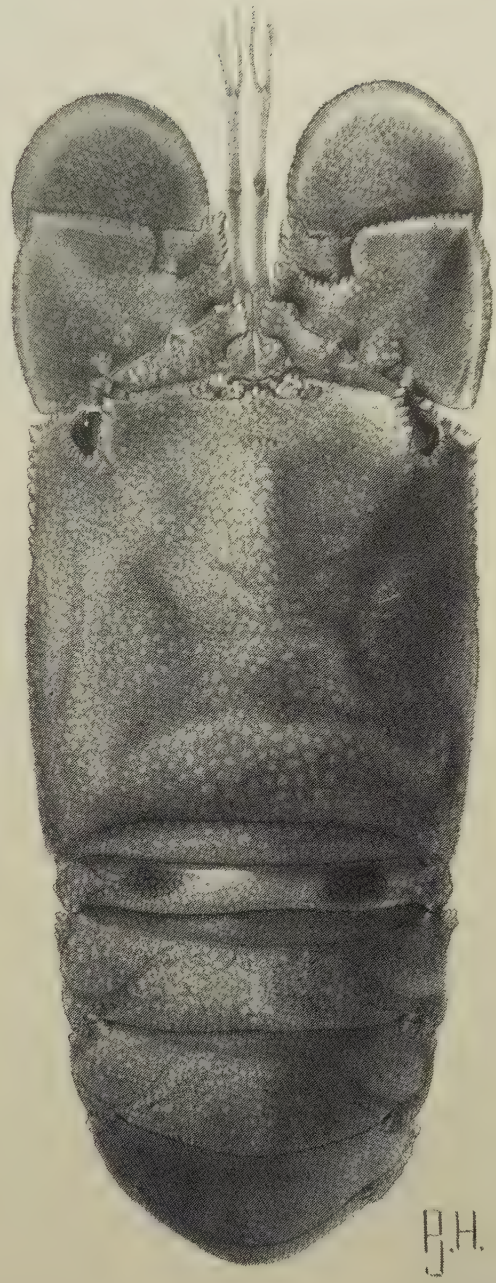


Fig. 351

Scyllarides deceptor Holthuis, 1963

Fig. 353

SCYL Scyld 9

Scyllarides deceptor Holthuis, 1963, Proceedings Koninklijke Nederlandse Akademie Weten-schappen, (C) 66:57.

Synonyms: The species has been confused with ***S. brasiliensis*** by some authors.

FAO Names : **En** - Hooded slipper lobster.

Type : Type locality: "Ubatuba, São Paulo State, Brazil" Holotype female in RMNH, no. D. 15451.

Geographical Distribution : Western Atlantic region: from southern Brazil (States of Rio de Janeiro, São Paulo and Santa Catarina) south to northern Argentina (Buenos Aires Province), 23.5°-39°S (Fig. 354).

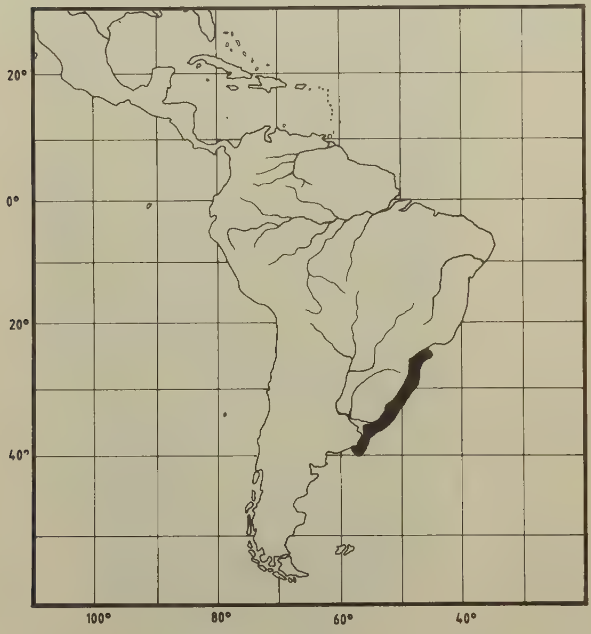


Fig. 354

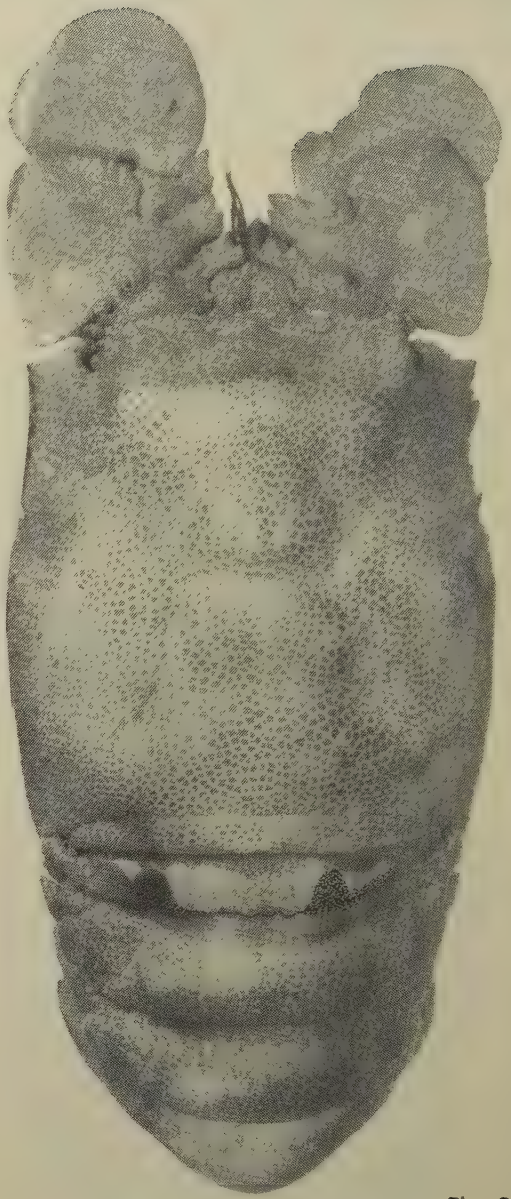


Fig. 353

Habitat and Biology : Found in depth between 45 and 200 m. Little is known about the substrate on which the animals live, except for one record from a sandy bottom.

Size : Total body length about 13 to 27 cm; carapace length 5 to 12 cm.

Interest to Fisheries : The species is occasionally caught in trawls, but it is not specially fished for and evidently is too rare to become of economic interest.

Local Names : BRAZIL: Lagosta, Lagostim.

Literature : Ramos, 1951:125, pls 1,2 (as ***S. brasiliensis***); Williams, 1986:27, fig. 67.

Scyllarides delfosi Holthuis, 1960

Fig. 355

SCYL Scyld 10

Scyllarides delfosi Holthuis, 1960, Proceedings Biological Society Washington, 73:153.

FAO Names : En - Three-spot slipper lobster.

Type : Type locality: "off the Suriname coast (6°41'N, 55°26.5'W, depth 23 fathoms [= 42 m], bottom mud, shells, and coral)". Holotype male in RMNH, no. D 12735.

Geographical Distribution : Western Atlantic region: north coast of South America from Venezuela (Sucre State) to Brazil (Ceará State) (Fig. 356).

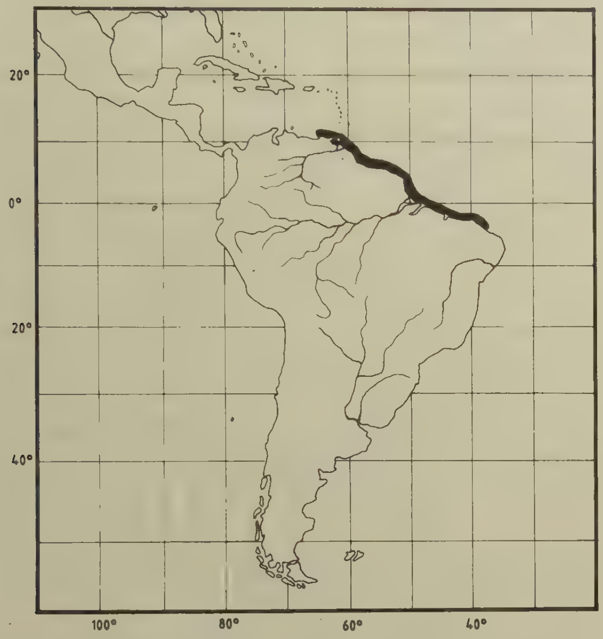


Fig. 356

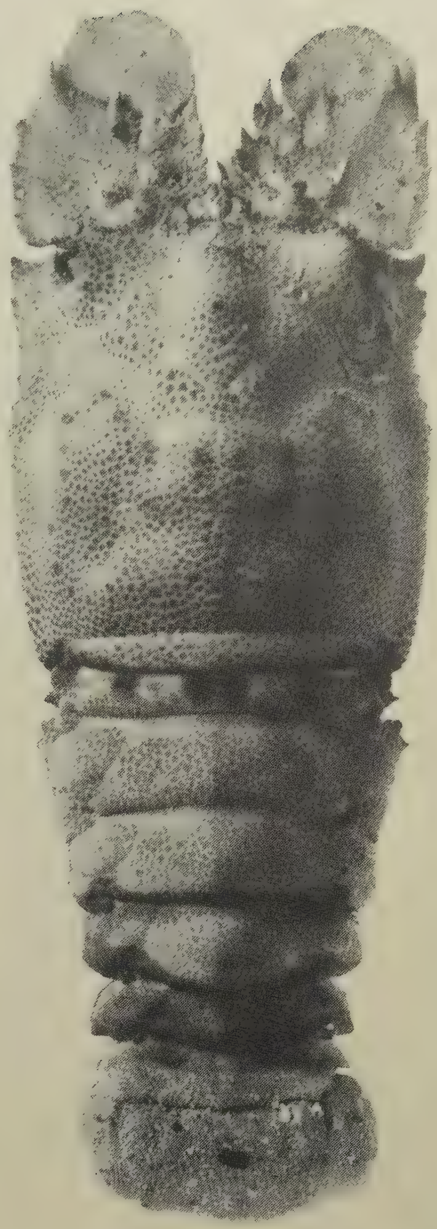


Fig. 355

Habitat and Biology : Reported from depths between 42 and 80 m, substrate mud.

Size : Total body length to 25 cm; carapace lengths of 6 to 9 cm have been reported.

Interest to Fisheries : Minor. The species is sometimes taken in trawls and dredges, but not in commercially interesting quantities. Fausto Filho (1968:27,28) classed this species as of "insignificante valor comercial". Opresko et al. (1973:38) remarked that "the species probably could be taken commercially by either trawl or trap if sufficient populations are found".

Local Names : BRAZIL: Lagosta japonesa, Lagosta sapateira, Sapata.

Literature : Opresko et al., 1973:38, fig. 14.

Scyllarides elisabethae (Ortmann, 1894)

SCYL Scyld 5

Scyllarides elisabethae (Ortmann, 1894), Denkschriften medicinisch-naturwissenschaftlichen Gesellschaft, Jena, 8:20, pl. 2 fig. 3.

FAO Names : **En** - Cape slipper lobster; **Fr** - Cigale du Cap; **Sp** - Cigarra del Cabo.

Type : Type locality: "Port Elisabeth" (= Port Elizabeth, Cape Province, South Africa). Holotype male in MZS, preserved dry, condition poor.

Geographical Distribution : Indo-West Pacific region: only known from S.E. Africa (from Inhambane, Mozambique to Cape Agulhas, Cape Province, South Africa; about from 24° to 34°50'S) (Fig. 358).

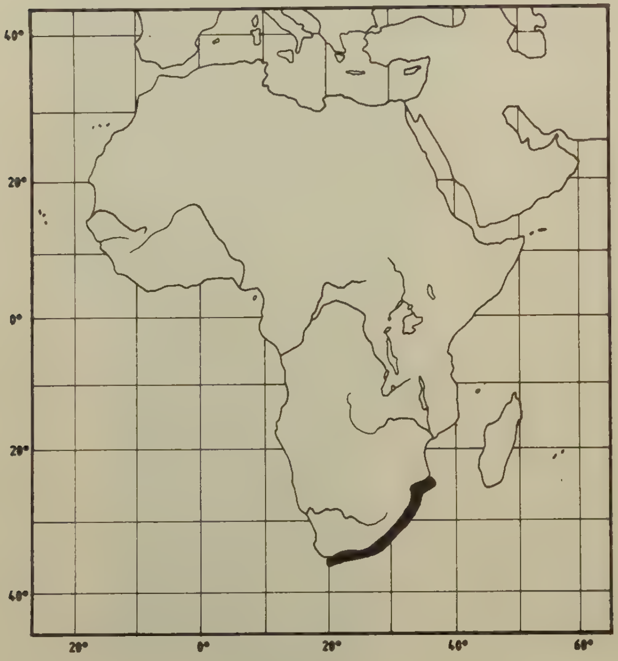


Fig. 358

Fig. 357

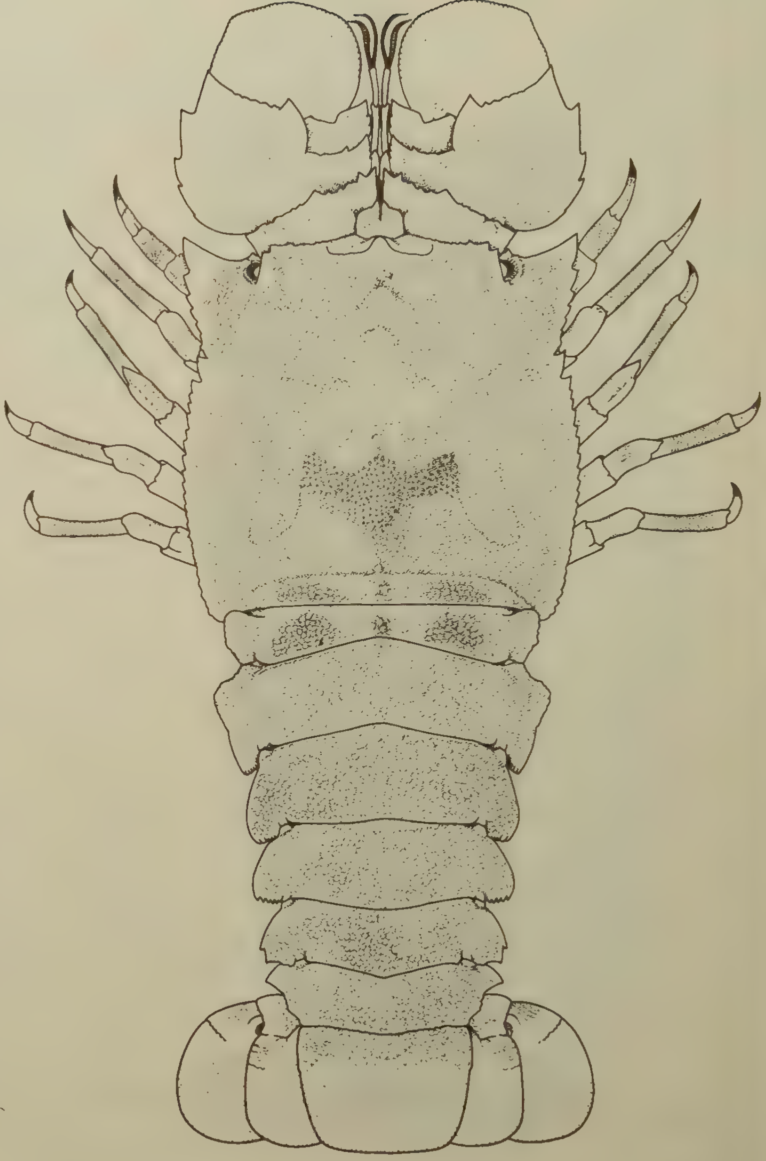


Fig. 357

Habitat and Biology : Depth range from 37 to 380 m (mostly less than 100 m) on a substrate of fine sediments, mud or fine sand. The animals seem to dig into the mud.

Size : Maximum total body length over 20 cm; carapace length to 9 cm.

Interest to Fisheries : Minor. The species is occasionally taken by trawlers, but there is no special fishery for it, although Von Bonde (1930:5) remarked that it "occurs off the coast of Natal in such numbers as to be of economic importance".

Local Names : MOZAMBIQUE: Cava-cava do Cabo; SOUTH AFRICA: Port Elizabeth crayfish, Digging lobster, Port Elizabeth crawfish, Port Elizabeth rock lobster.

Literature : Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986:29, figs 73, 80 n-o.

Scyllarides haanii (De Haan 1841)

Fig. 359

SCYL Scyld 11

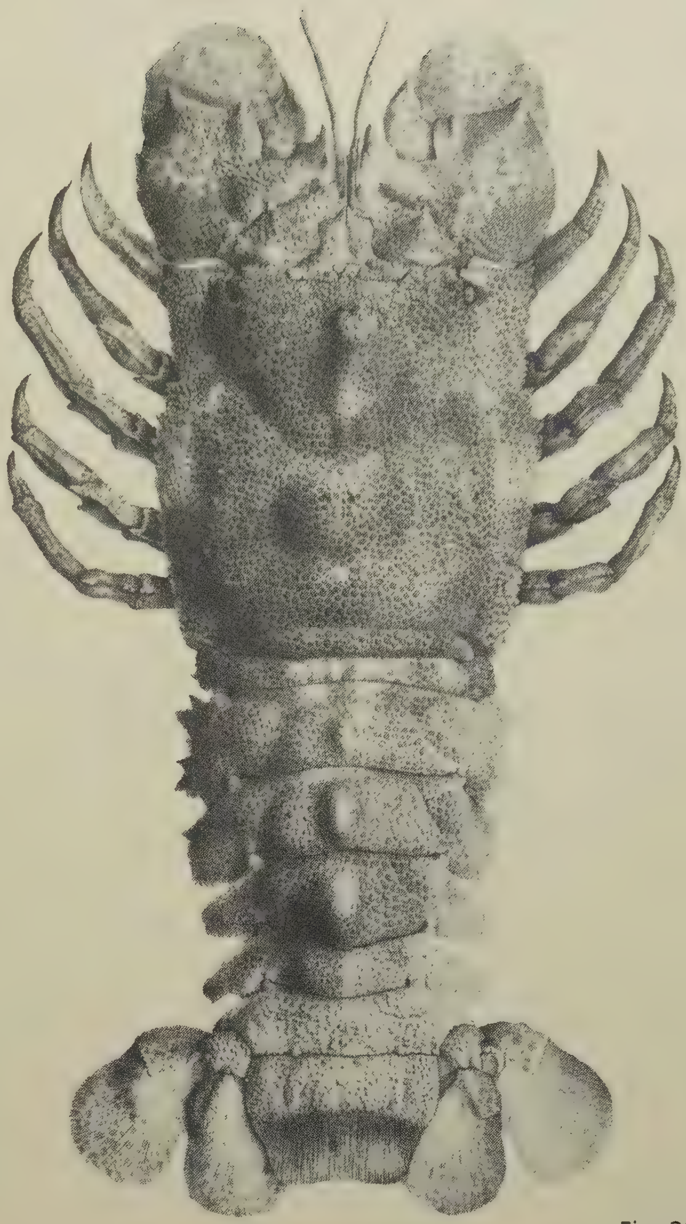
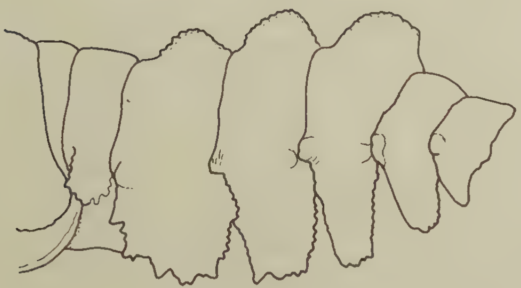


Fig. 359

Scyllarides haanii De Haan 1841, in P.F. von Siebold, Fauna Japonica, (Crust.), (5): 152.

FAO Names : **En** - Aesop slipper lobster.

Type : Type locality: "Japonia", probably in the area of Nagasaki, Kyushu. Lectotype male in RMNH, no. D 5520.



lateral view of abdomen

Geographical Distribution : Indo-West Pacific region: from the Red Sea and the western Indian Ocean (Mauritius) to Japan (Sagami Bay and south), Korea, China (southeast coast and Taiwan Island), Indonesia, Australia, and Hawaii (Fig. 360).

Habitat and Biology : Known from depths between 10 and 135 m. Probably on rocky bottom.

Size : Total body length up to 50 cm. The carapace lengths reported vary between 4.5 and 17 cm.

Interest to Fisheries : The species as a rule is only incidentally caught, but it is used for food and offered for sale fresh at local markets (e.g., in Korea, Japan and Hawaii). It is usually taken with lobster pots.

Local Names : JAPAN: Kobu semi-ebi.

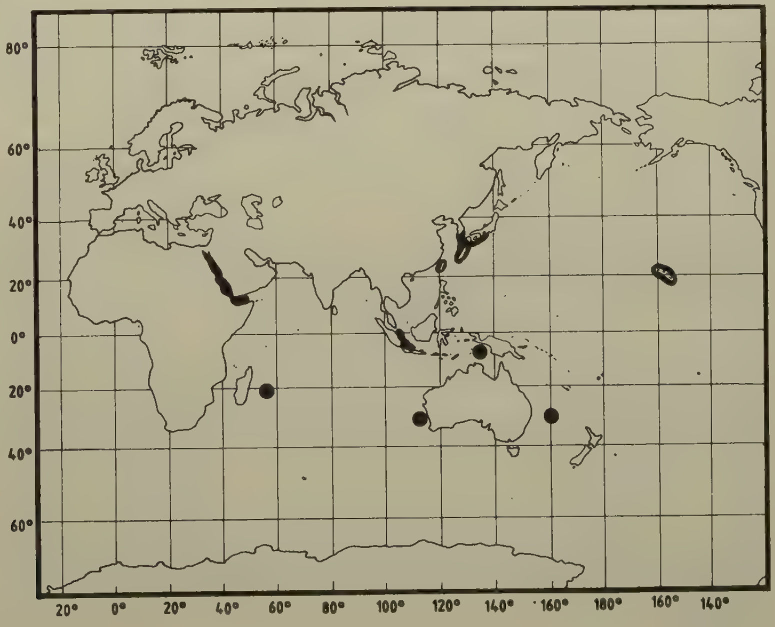


Fig. 360

Scyllarides herklotsii (Herklots, 1851)

Fig. 361

SCYL Scyld 4

Scyllarus herklotsii Herklots, 1851, Additamenta ad faunam carcinologicam Africae occidentalis: 14, pl. 2 figs. 14, 15.

Synonyms: Formerly sometimes identified with ***Scyllarides latus.***

FAO Names : **En** - Red slipper lobster; **Fr** - Cigale rouge; **Sp** - Cigarra roja.

Type : Type locality: "prope Boutry" [= Butri, Ghana, 4°50'N 1°56'W]. Lectotype male in RMNH, no. D. 973.

Geographical Distribution : Eastern Central Atlantic region: West Africa from northern Senegal (St. Louis, 16°N) to southern Angola (Ponta do Pinda, 15°45'S) (Fig. 362).

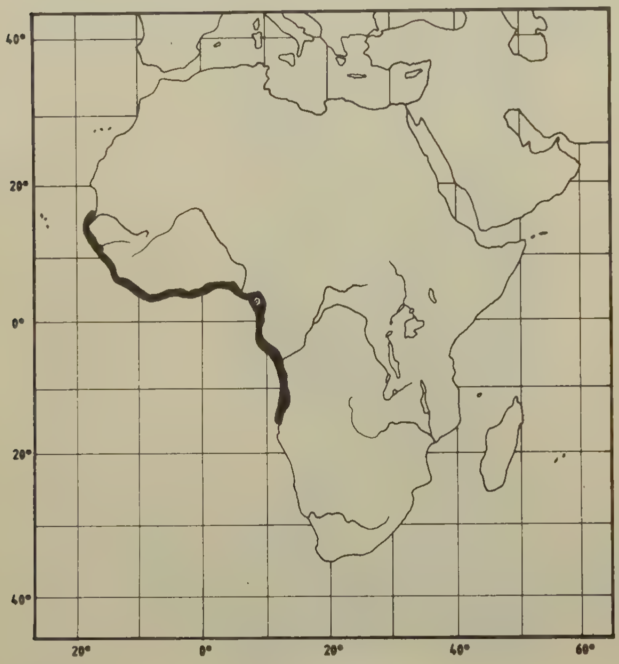


Fig. 362

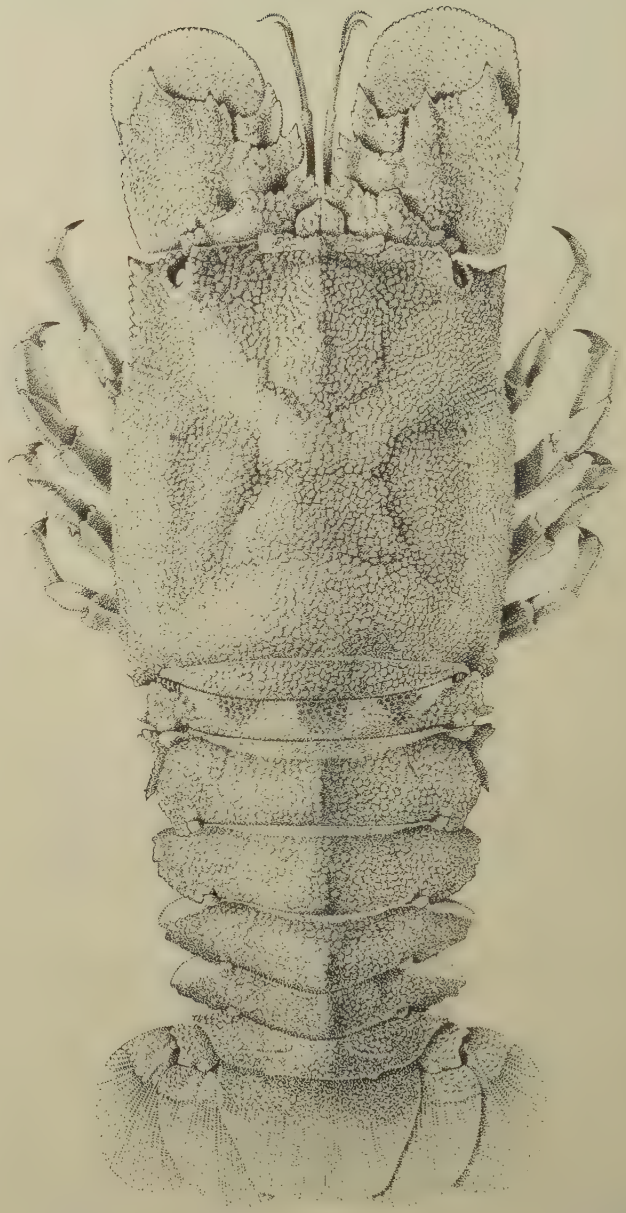


Fig. 361

Habitat and Biology : Found mostly in depths between 5 and 70 m, but also reported from deeper waters (beyond 200 m); on substrates of sand and rock, sometimes on mud.

Size : Maximum total body length about 32 cm, usually not more than 25 cm.

Interest to Fisheries : Minor. The species is fished for food everywhere it occurs; it usually is caught in vertical nets, sometimes in trawls. There is no special fishery for it, it is taken only accidentally. It is marketed fresh on the local markets.

Local Names : ANGOLA: Cigarra do mar, Lagosta da pedra; GHANA: Po-sesaw (Fante language), Red squat lobster.

Literature : Fischer, Bianchi & Scott (eds), 1981: vol. 5; Williams, 1986: 28, figs 68, 80 j-k.

Scyllarides latus (Latreille, 1802)

Fig. 363

SCYL Scyld 1

Scyllarus latus Latreille, 1802, Histoire naturelle, générale et particulière, des Crustacés et des Insectes, 6:182

Synonyms: ***Pseudibacus veranyi*** Guérin Méneville, 1855.

FAO Names : **En** - Mediterranean slipper lobster; **Fr** - Grande cigale; **Sp** - Cigarra.

Type : Type locality of ***S. latus***: "Méditerranée". As lectotype is now chosen the specimen figured by C. Gesner (1558, Historia Animalium liber IIII:1097); this specimen was drawn by Cornelius Sittardus in Rome and evidently came from the coast near Rome, as the figure was made after a fresh specimen. The type is lost, but the original figure by C. Sittardus, published by Gesner is now in RMNH (in collection L.B. Holthuis).

Type locality of ***Pseudibacus veranyi***: "aux environs de Nice", S. France. Whereabouts of type unknown.

Geographical Distribution : Mediterranean and eastern Atlantic from the coast of Portugal (near Lisbon) to Senegal, Madeira, the Azores, the Selvagens Islands and Cape Verde Islands (Fig. 364).

Habitat and Biology : Found in depths between 4 and 100 m on a rocky or sandy substrate. Food consists mainly of molluscs, especially limpets (*Patella* sp.). Ovigerous females from June to August.

Size : Maximum total body length about 45 cm, usually not more than 30 cm. Carapace length to 12 cm.

Interest to Fisheries : The species is taken and eaten wherever it occurs, but because it is rather rare, there is no commercially important fishery. It is incidentally taken with trammel nets, trawls and lobster pots, also by hand (divers). Scuba diving made its habitat more accessible to collectors, and in some areas the population of ***Scyllarides*** had to pay a heavy toll because of this. The species is sold on the local markets, either fresh or frozen. In Israel 2 to 3 tons are taken annually, elsewhere it is only occasionally offered for sale. The meat is very tasty; already Risso (1816:60) remarked that "la chair égale, par sa bonté celle des meilleurs crustacés de la Méditerranée".

Local Names : ALGERIA: Grosse cigale, Cigale courte; CAPE VERDE: Carrasco; FRANCE: Cigale, Grand Scyllare, Grande cigale, Grosse cigale, Homard plat, Macietta; GERMANY: Grosser Bärenkrebs; GREECE: Caravida; ITALY: Cicala grande, Magnosa (official names), Cicala di mare; MALTA: Ccala hamra, Ccala seula; MOROCCO: Feritah; PORTUGAL: Lagosta (Madeira), Lagosta de pedra; SPAIN: Cigarra de mar, Cigala gran, Sapa; TUNISIA: Cigale noire, Farzit; YUGOSLAVIA: Kuka, Kukica.

Literature : Palombi & Santarelli, 1961:373,374 (many local names); Fischer, Bianchi & Scott (eds), 1981:vol. 5; Fischer, Bauchot & Schneider (eds), 1987:316.

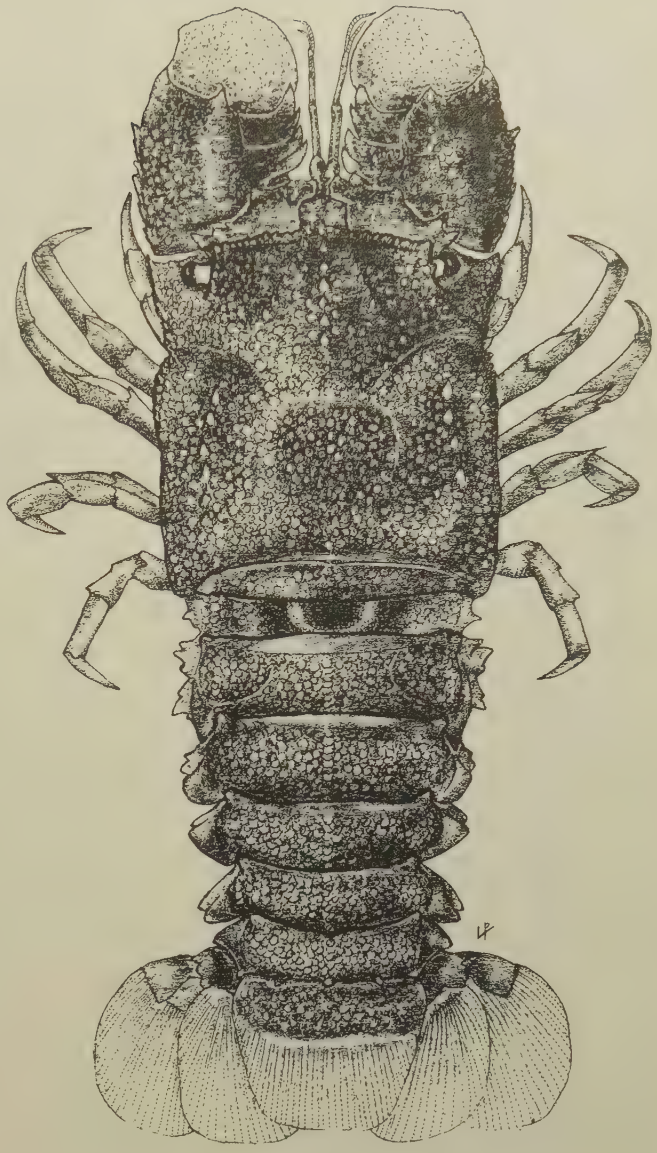


Fig. 363

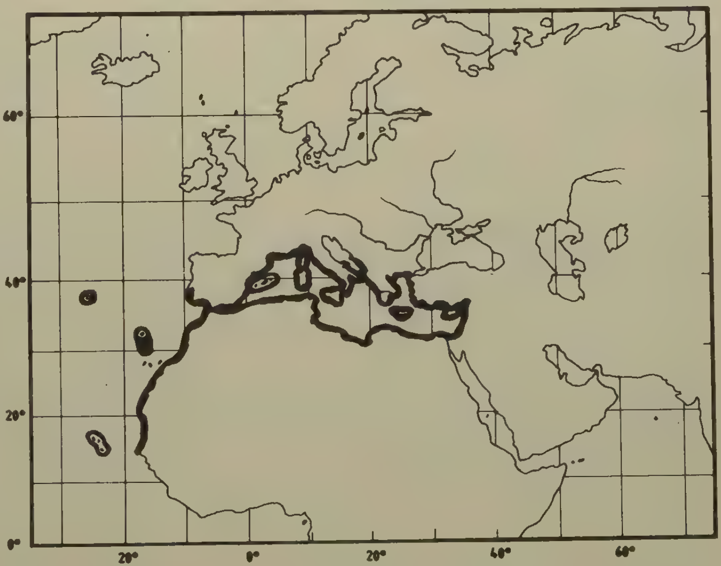


Fig. 364

Scyllarides nodifer (Stimpson, 1866)

Fig. 365

SCYL Scyld 3

Scyllarus nodifer Stimpson, 1866, Proceedings Chicago Academy Sciences, 1:48.

Synonyms: ***Scyllarides americanus*** Verrill, 1922.

FAO Names : **En** - Ridged slipper lobster; **Fr** - Cigale chambré; **Sp** - Cigarra de quilla.

Type : Type locality of ***S. nodifer***: "Found among the Florida Keys ... at the Tortugas ... and ... from Key West". Syntypes in USNM and MCZ, now probably lost.

Type locality of ***S. americanus***: "Bermuda". Lectotype male (coll. by T.H. Bean) in USNM, no. 21607.

Geographical Distribution : Western Atlantic region: Bermuda and coast of USA south of Cape Lookout, North Carolina, entire Gulf of Mexico (Florida to Yucatan) (Fig. 366).

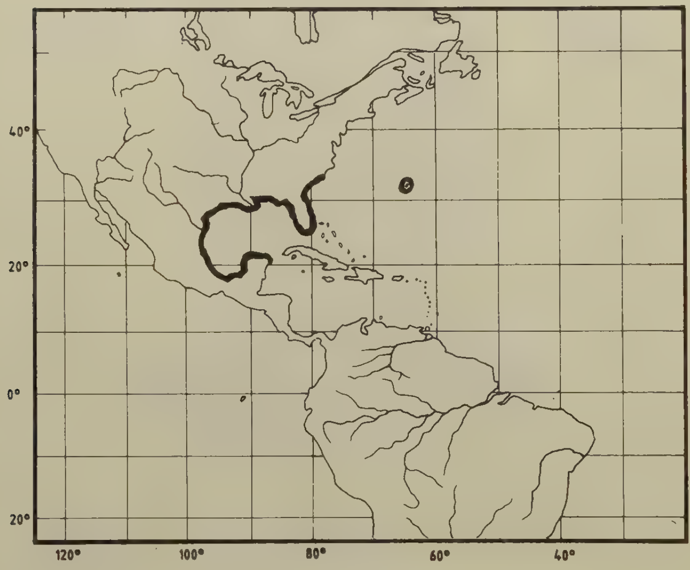


Fig. 366

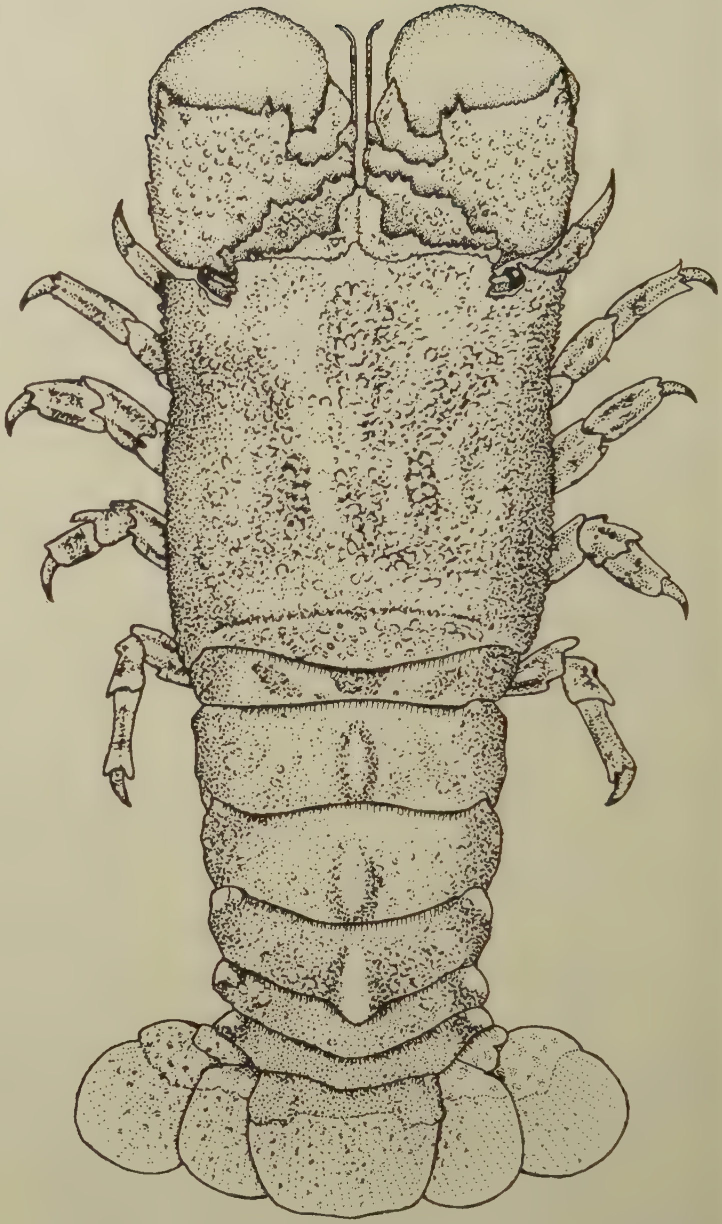


Fig. 365

Habitat and Biology : Known from depths between 2 and 91 m on a sandy substrate, sometimes mixed with mud, shells or corals.

Size : Total body length to about 35 cm; carapace length to 11 cm.

Interest to Fisheries : Minor. There is no special fishery for the species, but if taken it is used as food or bait. It is mostly obtained in traps set for other species. Marketed fresh.

Local Names : USA: Bulldozer, Ridged slipper lobster, Spanish lobster.

Literature : Lyons, 1970:7, text-fig.3, pl. 1 figs A, B; Fischer (ed.), 1978: vol. 6.

Scyllarides roggeveeni Holthuis, 1967

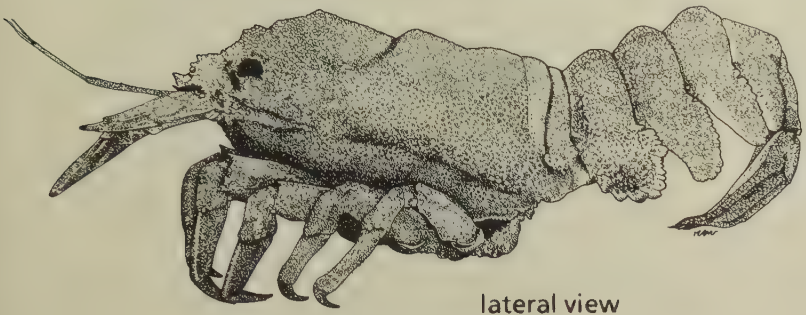
Fig. 367

SCYL Scyld 12

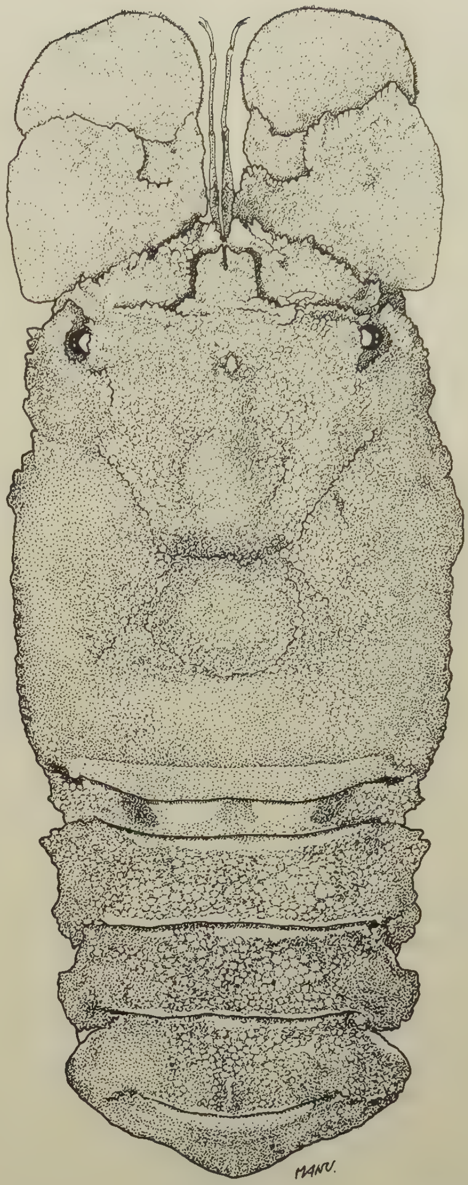
Scyllarides roggeveeni Holthuis, 1967, Proceedings Koninklijke Nederlandse Akademie Wetenschappen, (C) 70:306.

FAO Names : **En** - Easter Island slipper lobster.

Type : Type locality: "Hanga Pico, S.W. Easter Island". Holotype male in RMNH, no. D 21258.



lateral view



dorsal view Fig. 367

Geographical Distribution : Only known from Easter Island (Fig. 368).

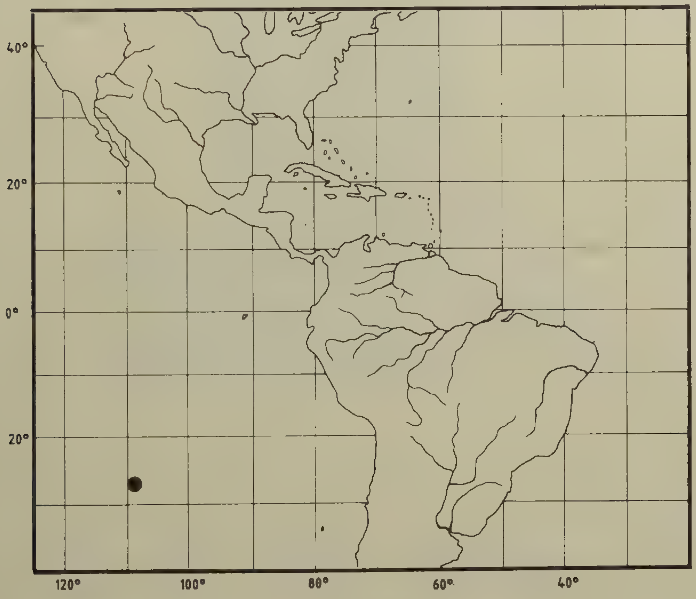


Fig. 368

Habitat and Biology : Very little is known about the ecology of the species, except that all known specimens were caught in lobster traps.

Size : The carapace length of the type is 11 cm, the total body length about 30 cm.

Interest to Fisheries : The species so far is known only from 4 specimens all taken in lobster traps. There is no regular fishery for the species, the known specimens being all caught accidentally (Henriquez, 1974:4). Judging by the size of the specimens and by the fact that the other species of the genus are eaten, it is most likely that also ***S. roggeveeni*** is used as food.

Local Names : CHILE: Raperape, Ura raperape (Easter Island).

Literature : Holthuis, 1972:49, pl. 2.

Scyllarides squammosus (H. Milne Edwards, 1837)

Fig. 369

SCYL Scyld 6

Scyllarus squammosus H. Milne Edwards, 1837, Histoire naturelle des Crustacés, 2:284.

Synonyms: ? ***Scyllarus australis*** Fabricius, 1781; ***Scyllarus sieboldi*** De Haan, 1841; ***Pseudibacus pfefferi*** Miers, 1882.

FAO Names : En - Blunt slipper lobster; **Fr** - Cigale grenue; **Sp** - Cigarra ñato.

Type : Type locality of ***S. squammosus***: "Habite l'Ile-de-France" (= Mauritius). Type in MP, now lost; there is a dry specimen in good condition in the Paris Museum (Pa 408) from "Ile de France" but it is much smaller than the type, 21.5 cm instead of "15 pouces" (= about 37.5 cm).

Type locality of ***S. sieboldi***: "Nagasaki", Kyushu, Japan; in manuscript notes on the type material the collector wrote (in translation) "is caught sometimes in the months of spring in the outer bays near Nagasaki" (see Holthuis & Sakai, 1970:113). Lectotype male in RMNH, no. D 959.

Type locality of ***Pseudibacus pfefferi***: "Mauritius". Three syntypes in BM, no. 81.7, condition poor.

Type locality of ***S. australis***: "Habitat in Oceano australiori. Mus.Dom.Banks". Type lost.

Geographical Distribution : Indo-West Pacific region: from East Africa to Japan, Hawaii, Melanesia, New Caledonia and Australia (Fig. 370)

Habitat and Biology : In depths of "a few fathoms" to about 80 m, most common between 20 and 50 m. On reefs and rocky areas. Nocturnal.

Size : Maximum total body length about 40 cm; carapace length up to about 15 cm.

Interest to Fisheries : Its large size and well developed fleshy tail make this species, like other species of the genus, a sought-after delicacy. It is scarce and lives in inaccessible places and therefore is not commercially fished. The animals are mostly taken by hand usually at night, but also wire traps are used. They are sold fresh on the local markets.

Local Names : AUSTRALIA: Slipper lobster; JAPAN: Semi-ebi, Semi-gani, Sjako-ebi; MOZAMBIQUE: Cava-cava scamosa; USA: Scaly slipper lobster, Sea crawfish, Ula-pápapa (Hawaii);

Literature : Fischer & Bianchi (eds), 1984:vol. 5.

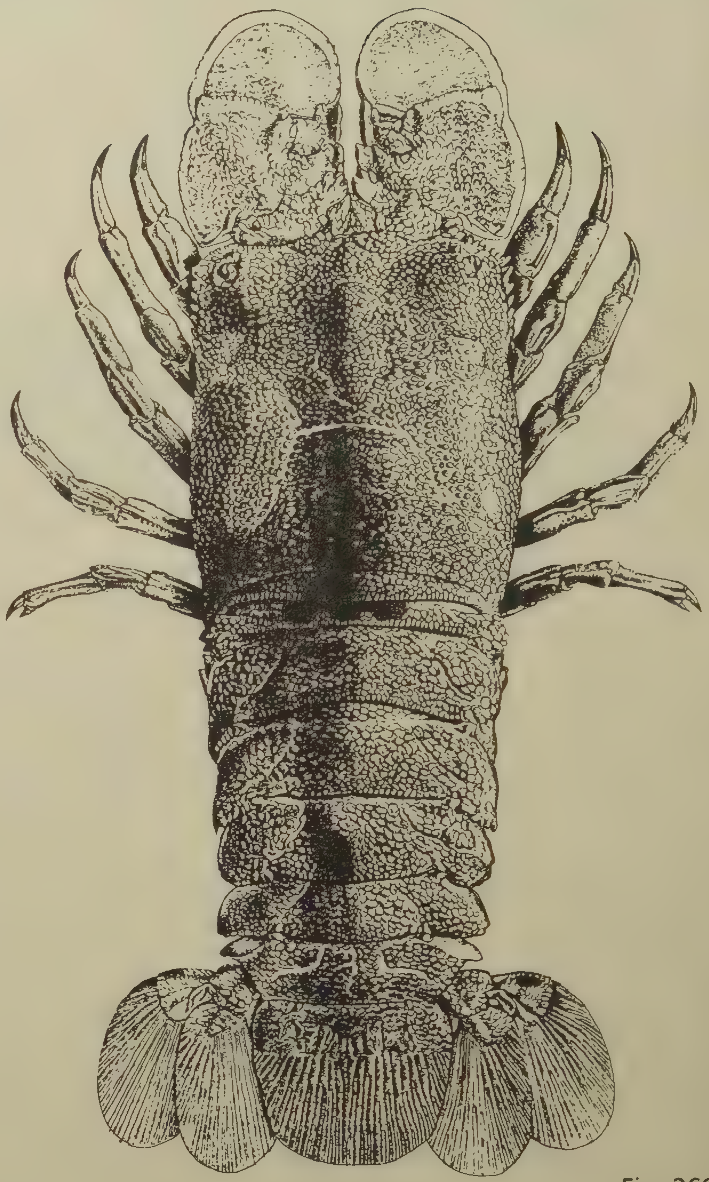


Fig. 369

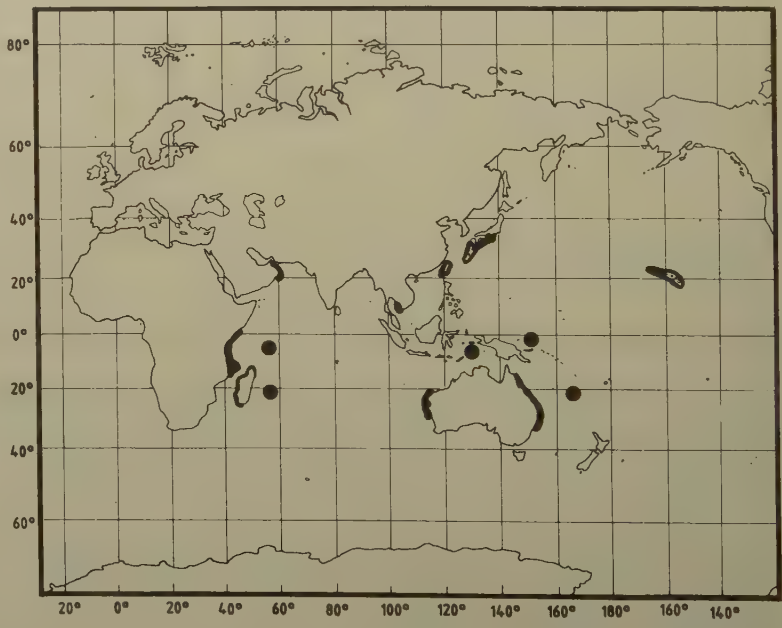


Fig. 370

Scyllarides tridacnophaga Holthuis, 1967

Fig. 371

SCYL Scyld 13

Scyllarides tridacnophaga Holthuis, 1967, Proceedings Koninklijke Nederlandse Akademie Wetenschappen, (C)70: 307.

FAO Names : En - Clamkiller slipper lobster.

Type : Type locality: "Eylath, Gulf of Aqaba, Israel". Holotype female in RMNH, no. D 23023.

Geographical Distribution : Indo-West Pacific region: Red Sea, E. Africa (Somalia, Kenya), Gulf of Aden, Pakistan, west coast of Thailand (Fig. 372).

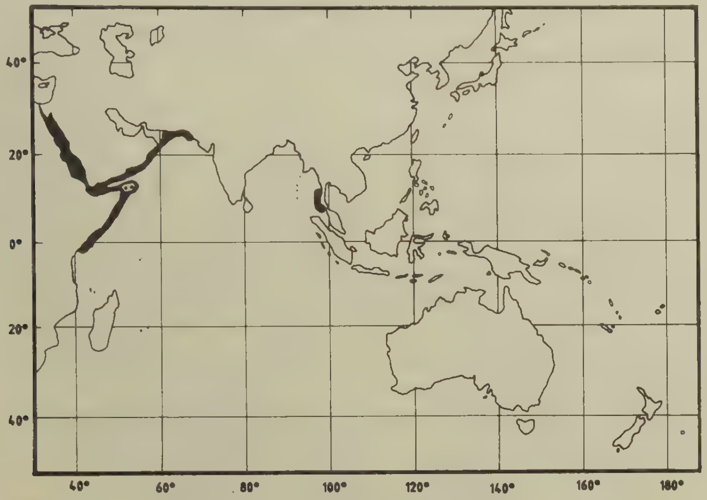


Fig. 372

Habitat and Biology : Depth range from 5 to 112 m; substrates unknown. The species has been observed to open live *Tridacna* shells; it also eats other molluscs and dead fish.

Size : Total body length up to about 30 cm; carapace lengths reported vary between 6 and 12 cm.

Interest to Fisheries : There are no reports about the economic value of the species, but judging by its size and the fact that all other species of the genus are comestible, it is likely that the specimens caught will be used as food.

Literature : Holthuis, 1968:295, pls 1, 2.

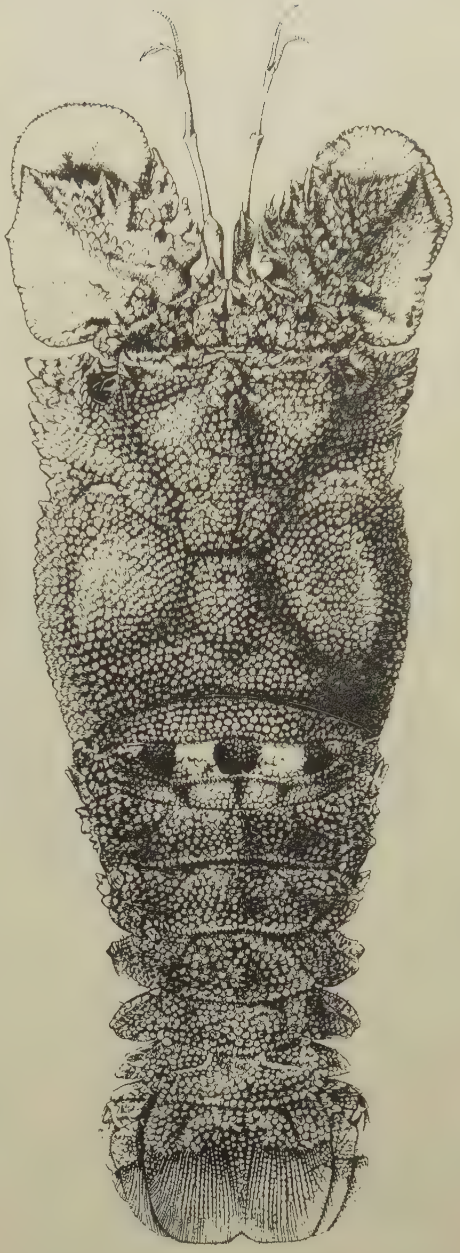


Fig. 371

SUBFAMILY **IBACINAE** Holthuis, 1985

Ibacinae Holthuis, 1985, Zoologische Verhandelingen, Leiden, 218:10-12.

Type Genus: ***Ibacus*** Leach, 1815.

The subfamily which Holthuis (1985) revised, providing keys to all species, includes three genera, all of which are treated here.

Evibacus S.I. Smith, 1869

SCYL Ev

Evibacus S.I. Smith, 1869, American Journal Science, (2)48:118. Gender masculine.

Type Species: by monotypy: ***Evibacus princeps*** S.I. Smith, 1869.

This genus, which is restricted to the Eastern Pacific region, has only a single species.

Evibacus princeps S.I. Smith, 1869

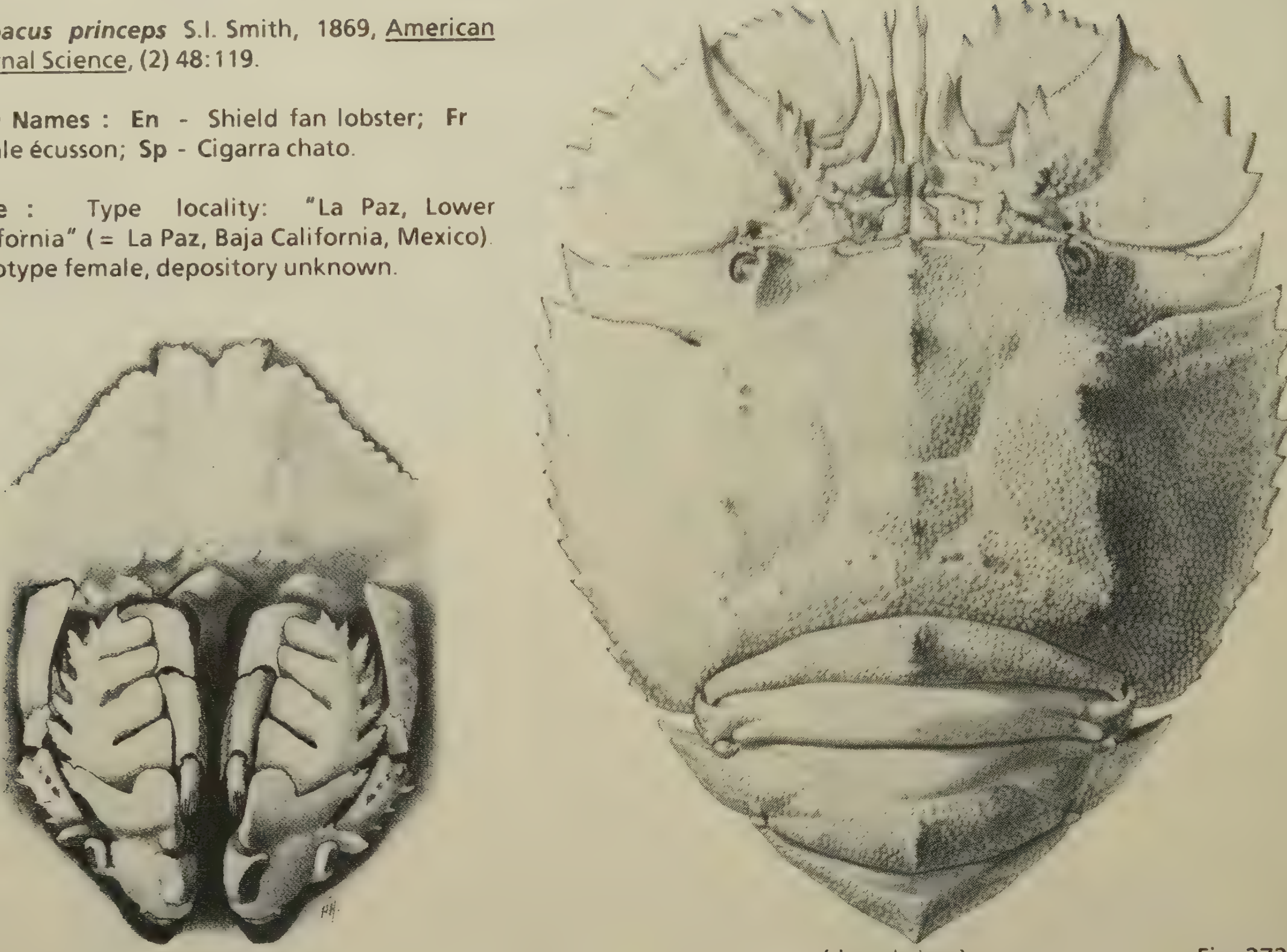
SCYL Ev 1

Evibacus princeps S.I. Smith, 1869, American Journal Science, (2) 48:119.

FAO Names : **En** - Shield fan lobster; **Fr** Cigale écusson; **Sp** - Cigarra chato.

Type : Type locality: "La Paz, Lower California" (= La Paz, Baja California, Mexico). Holotype female, depository unknown.

Fig. 373



mouth field (ventral view)
(from Holthuis, 1985)

(dorsal view)

Fig. 373

Geographical Distribution : Eastern Pacific region: from Gulf of California (Mexico) to near Tumbes (Peru) (Fig. 374).

Habitat and Biology : Found in depths between 2 and 90 m, most common between 2 and 25 m. Bottom sand or mud, or a mixture, sometimes with rocks.

Size : Carapace length from 1 to 14.5 cm. Maximum total length about 33 cm.

Interest to Fisheries : Although the species is of excellent taste, reasonably large size, and occurs on trawlable substrates, it is not commercially exploited at present. Exploratory trawling in the Gulf of Panama showed it to be present there in fairly large quantities. When caught it is sold fresh in the local markets.

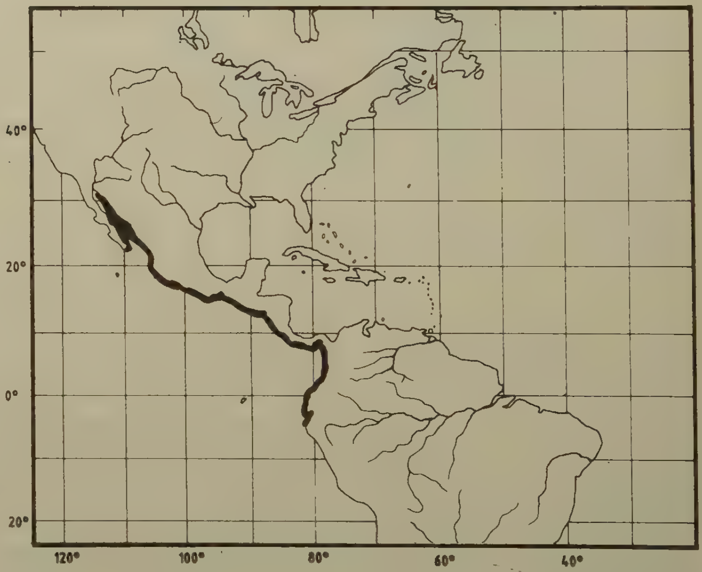


Fig. 374

Local Names : COSTA RICA, EL SALVADOR, GUATEMALA: Langosta de arena; MEXICO: Langosta de arena, Zapatera, Boot lobster, Flat lobster, Sand lobster, Slipper lobster; PANAMA: Langosta china, Chinese lobster, Pacific sand lobster, Sand lobster; PERU: Langosta chata, Langosta filipina.

Literature : Holthuis, 1985:13-20, figs 3,4.

Ibacus Leach, 1815

Ibacus Leach, 1815, Zoological Miscellany, 2:151. Gender masculine. Name placed on the Official List of Generic Names in Zoology in Opinion 519 (published in 1958).

Type Species: by monotypy: ***Ibacus peronii*** Leach, 1815.

At present 6 species of ***Ibacus*** are known. All are found at great depths in the Indo-West Pacific region, and most are of little or no economic importance. All are dealt with here.

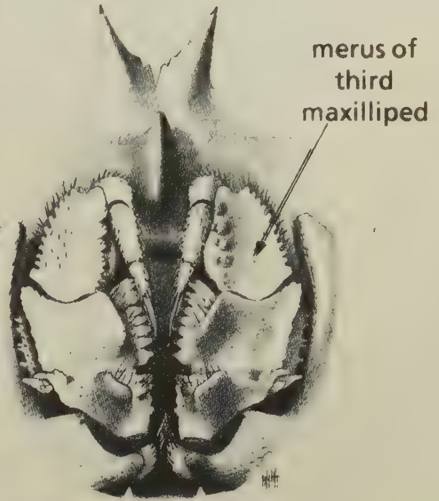
Key to Species:

1a. Merus of third maxilliped with the ventral surface slightly concave, not swollen, and not coloured differently from the other segments; inner margin sometimes crenulate but not with deep incisions (Fig. 375a)

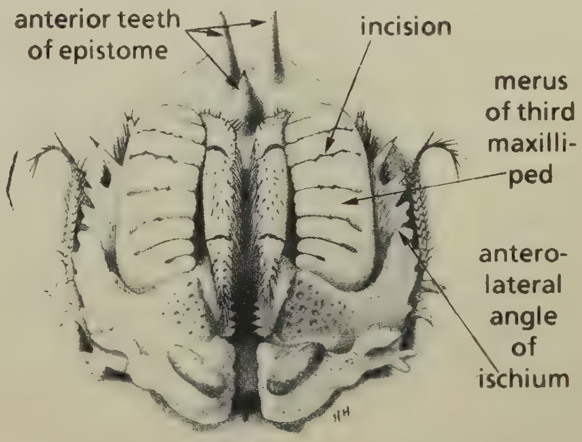
2a. Anterior margin of the wide cervical incision of the carapace forming the posterior margin of the anterolateral angle of the carapace; the carapace shows no lateral margin between the anterolateral angle and the cervical incision. The carapace has 7 to 9 posterolateral teeth (Figs 376, 377)

3a. Dorsal surface of the body with a short, woolly pubescence. Fourth segment of antenna slender, without lateral teeth, regularly narrowing from base to tip (Fig. 376) .... ***I. alticrenatus*** (Fig. 382)

3b. Dorsal surface of the body naked to the unaided eye, with microscopically small, scattered setae. Fourth segment of the antenna not slender, at first widening in a lateral direction before narrowing into the apex, with a distinct lateral margin that is provided with well-developed teeth (Fig. 377) .... ***I. brucei*** (Fig. 386)

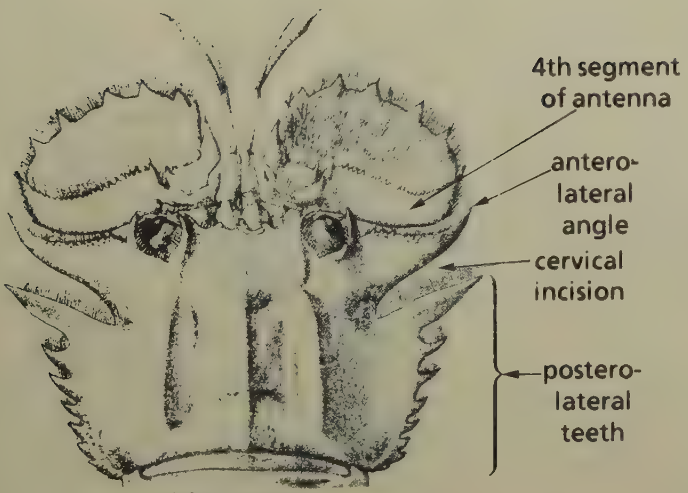

merus of third maxilliped

a. ***I. ciliatus ciliatus***

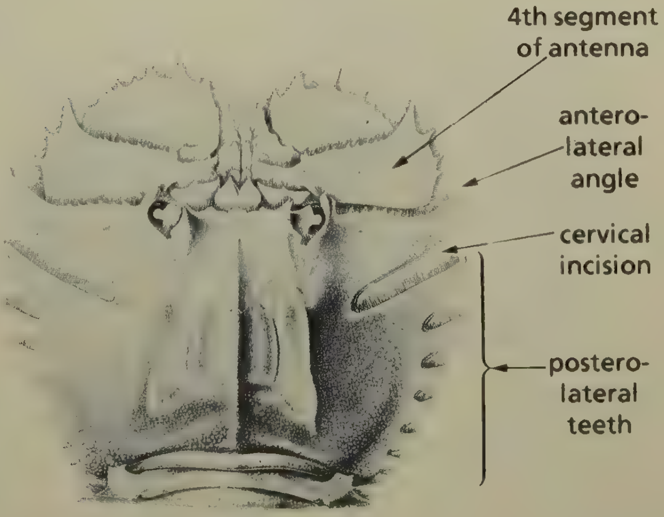

anterior teeth of epistome
incision
merus of third maxilliped
antero-lateral angle of ischium

b. ***I. peronii***

mouth field (ventral view) Fig. 375


4th segment of antenna
antero-lateral angle
cervical incision
postero-lateral teeth

I. alticrenatus
carapace (dorsal view)
Fig. 376


4th segment of antenna
antero-lateral angle
cervical incision
postero-lateral teeth

I. brucei
carapace (dorsal view)
Fig. 377

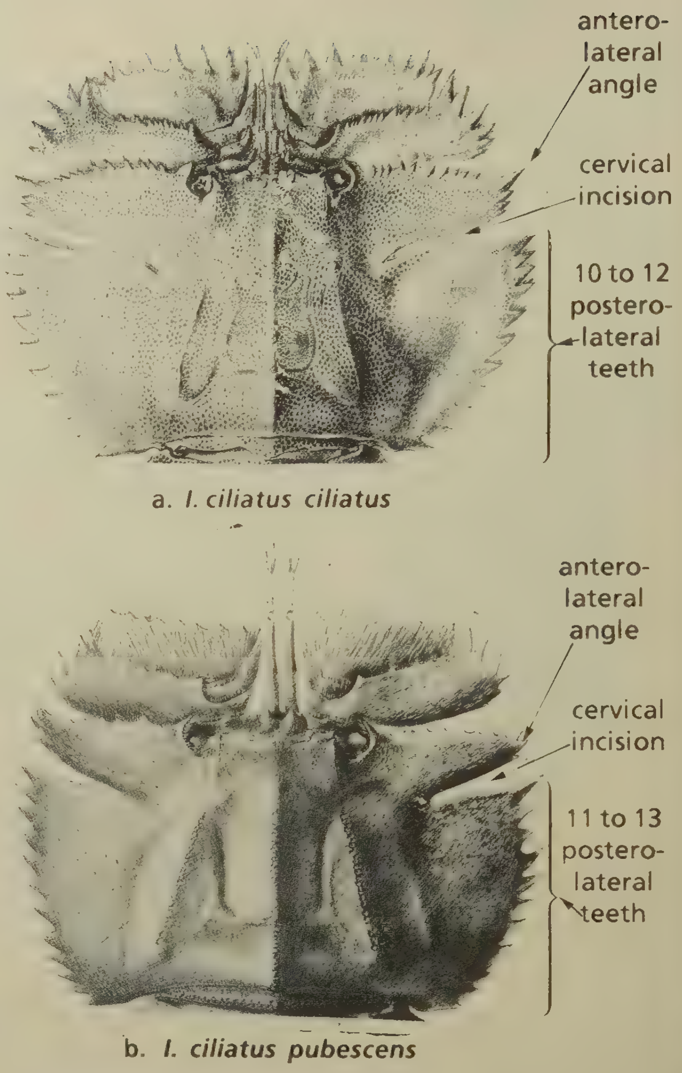
2b. Anterior margin of the narrow cervical incision of the carapace reaching the lateral margin some distance behind the anterolateral angle. Part of the lateral margin of the carapace extends between the anterolateral angle and the cervical incision and bears some teeth there. The carapace bears 10 to 13 posterolateral teeth (Fig. 378a,b)

4a. Carapace of adult specimens naked. Lateral margin of carapace with 10 to 12, usually 11 posterolateral teeth (Fig. 378a) .... ***I. ciliatus ciliatus*** (Fig. 388a)

4b. Carapace of adult specimens with a thick cover of a velvety pubescence. Lateral margin of carapace with 11 to 13, usually 12 posterolateral teeth (Fig. 378b) .... ***I. ciliatus pubescens*** (Fig. 388b)

1b. Merus of third maxilliped swollen, often with a yellowish tinge, with deep incisions on the inner margin, several of which may reach beyond the middle of the merus (Fig. 375b)

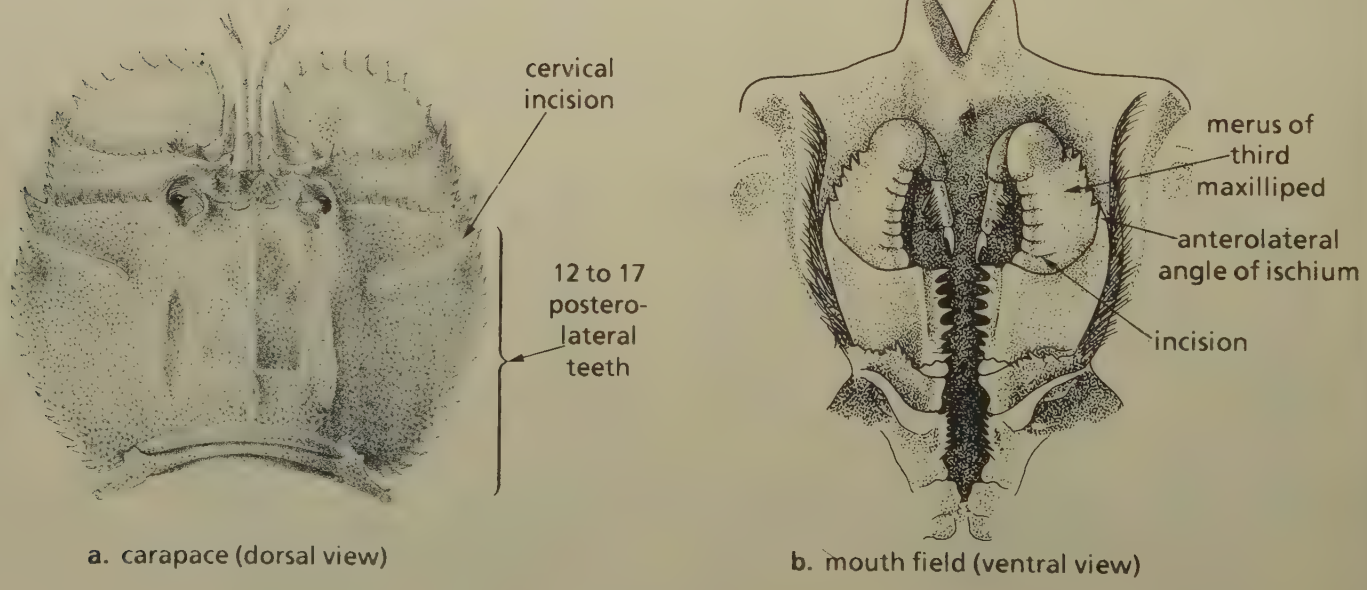
5a. Lateral margin of carapace behind cervical incision with 12 to 17 teeth (Fig. 379a). Merus of third maxilliped strongly swollen at the distal end, less so in the rest of its length; the incisions of the inner margin, though rather deep, not reaching the median line of the merus; anterolateral angle of ischium strongly produced, pointed, almost reaching halfway the length of the merus (Fig. 379b) .... ***I. brevipes*** (Fig. 384)


antero-
lateral
angle
cervical
incision
10 to 12
postero-
lateral
teeth
antero-
lateral
angle
cervical
incision
11 to 13
postero-
lateral
teeth

a. *I. ciliatus ciliatus*

b. *I. ciliatus pubescens*

carapace (dorsal view) Fig. 378


cervical
incision
12 to 17
postero-
lateral
teeth
merus of
third
maxilliped
anterolateral
angle of ischium
incision

a. carapace (dorsal view)

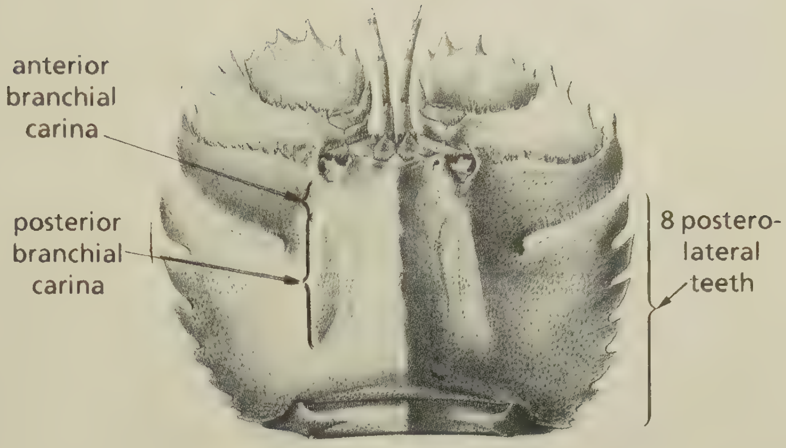
b. mouth field (ventral view)

I. brevipes Fig. 379

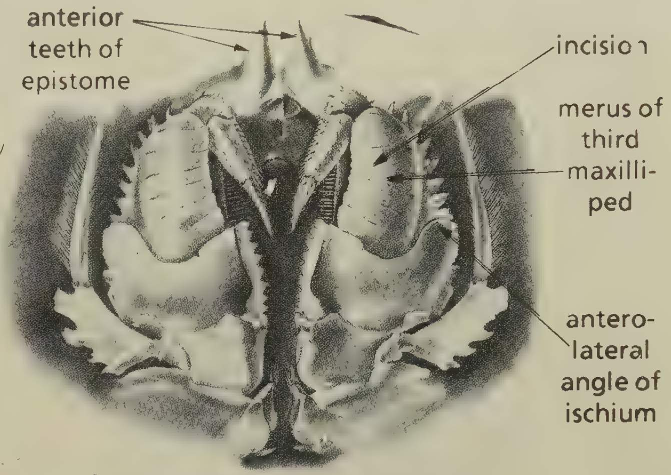
5b Lateral margin of carapace behind cervical incision with 6 to 8 teeth (Figs 380a, 381). Merus of third maxilliped evenly swollen, most of the incisions of the inner margin reach beyond the middle of the segment; anterolateral angle of ischium reaching only slightly beyond the base of the merus, top rounded (Figs 375b, 380b)

6a. Posterior branchial carinae of the carapace straight or only slightly convex, lying in one line with the anterior branchial carinae. Posterior incision of the orbit without tubercle. Lateral margin of carapace with 8 (rarely 7) posterolateral teeth (Fig. 380a). Anterior teeth of the epistome directed forwards (Fig. 380b) ... ***I. novemdentatus*** (Fig. 390)

6b. Posterior branchial carinae of the carapace strongly convex, not lying in one line with the anterior branchial carinae. Posterior incision of the orbit with a distinct tubercle. Lateral margin of carapace with 6 or 7, seldom 8, posterolateral teeth (Fig. 381). Anterior teeth of epistome directed ventrally (Fig. 375b) .... ***I. peronii*** (Fig. 392)

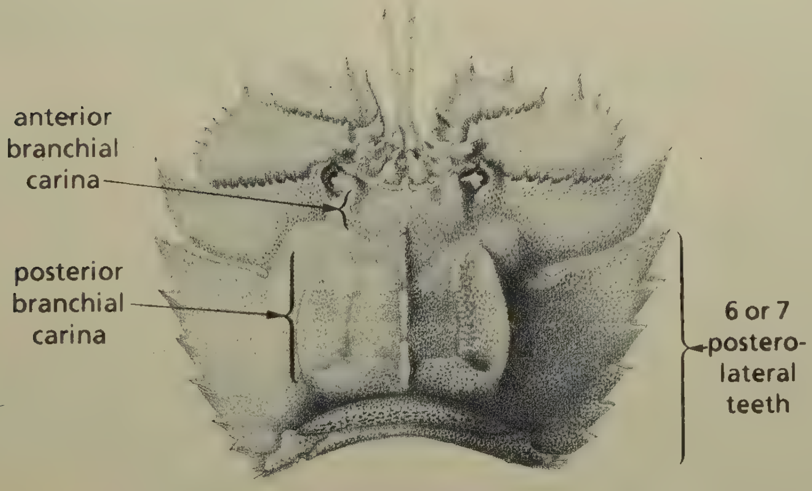

anterior branchial carina
posterior branchial carina
8 postero-lateral teeth

a. carapace (dorsal view)


anterior teeth of epistome
incision
merus of third maxilli-ped
antero-lateral angle of ischium

b. mouth field (ventral view)

I. novemdentatus Fig. 380


anterior branchial carina
posterior branchial carina
6 or 7 postero-lateral teeth

I. peronii
carapace (dorsal view) Fig. 381

Ibacus alticrenatus Bate, 1888

Fig. 382

SCYL Ib 2

Ibacus alticrenatus Bate, 1888, Report Voyage Challenger, Zool., 24:63, pl. 9 fig. 2.

Synonyms : ***Ibacus alticrenatus septemdentatus*** Grant, 1905.

FAO Names : En - Velvet fan lobster.

Type : Type locality of ***I. alticrenatus***: "Challenger" "Station 167, west of New Zealand ... lat. 39°32'S., long. 171°48'E.; depth, 150 fathoms [= 274 m]; bottom, blue mud". Four syntypes in BM, no. 88.22, in alcohol, condition fair.

Type locality of ***I. a. septemdentatus***: "About 28 miles east from Port Jackson Heads" near Sydney, N.S.W. Australia. "250-300 fathoms [= 457-549 m]". Two syntypes in AM, no. G. 5424.

Geographical Distribution : Australia (New South Wales, Bass Straits, Tasman Sea, Victoria, South Australia); New Zealand (North Island, South Island, Chatham Islands) (Fig. 383).

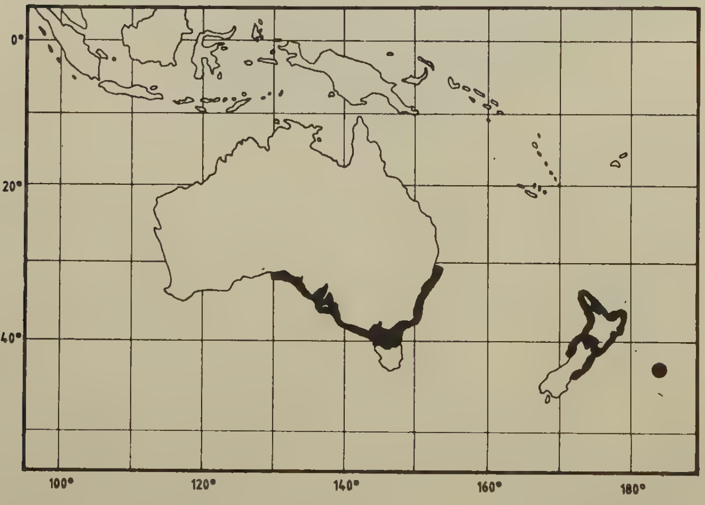
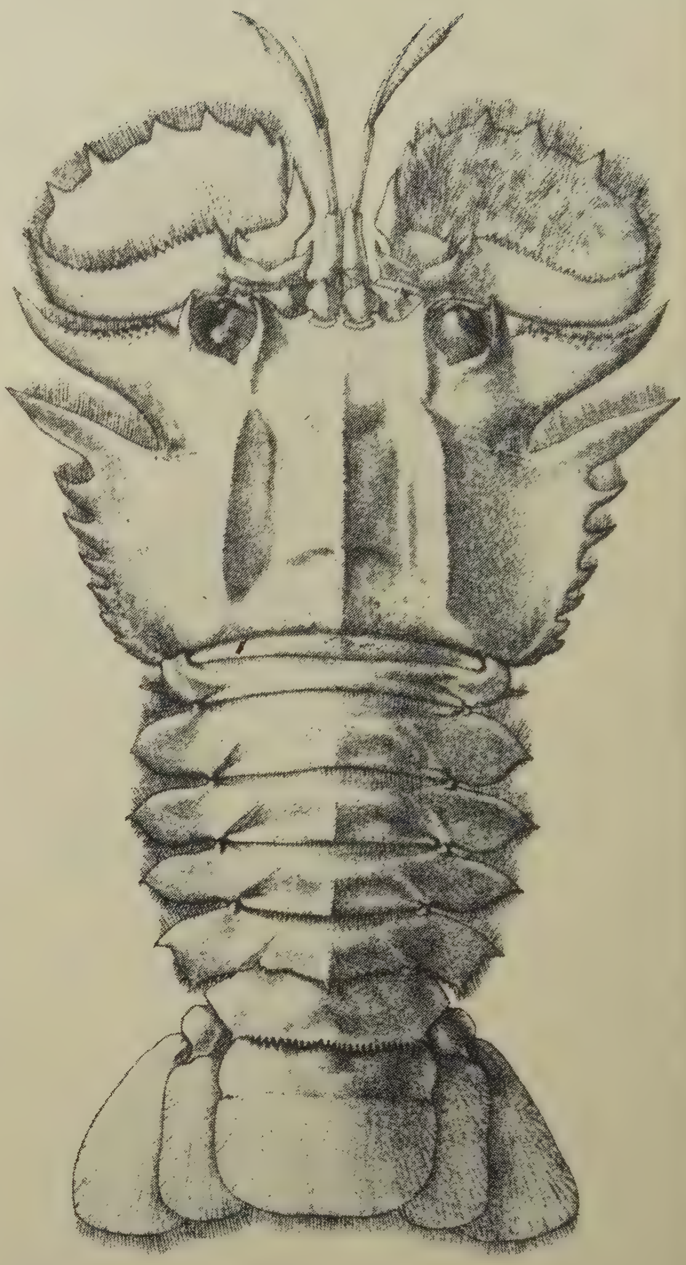


Fig. 383



(from Holthuis, 1985)

Fig. 382

Habitat and Biology : Depth range from 20 to 455 m, on soft muddy bottoms. Digs into the substrate and covers itself with the mud and sand. Ovigerous females from May to October.

Size : Carapace length 1.5 to 6.3 cm; maximum total length about 16 cm.

Interest to Fisheries : According to Lesser (1974:260) the species has no commercial value in New Zealand. But in New South Wales, Australia, "commercial quantities of ***Ibacus alticrenatus*** are still taken by trawlers working off the continental shelf by day and by night" (Coleman, 1977:132), and the species is sold at the Sydney market.

Local Names : AUSTRALIA: Deep water bug, Sandy bug; NEW ZEALAND: Prawn killer.

Literature : Holthuis, 1985:36-41, fig. 9.

Ibacus brevipes Bate, 1888

Fig. 384

Ibacus brevipes Bate, 1888, Report Voyage Challenger, Zool. 24:62, pl. 9 fig. 1.

Synonyms: ***Ibacus verdi*** Bate, 1888.

FAO Names : En - Serrate fan lobster.

Type : Type locality of ***I. brevipes***: "Challenger" Sta. 192, "lat. 5°49'15"S., long. 132°14'15"E.; off the Ki Islands [= Kai Islands, = Kepulauan Ewab, Eastern Indonesia]; depth, 140 fathoms [= 256 m]; blue mud". Holotype male in BM, no 88.22, in alcohol, condition fair.

Type locality of ***I. verdi***: "Challenger" "St. Vincent, Cape Verde Islands .... depth 7 to 20 fathoms" (= 13-37 m). Lectoptype female and 6 paralectotypes in BM, no. 88.22, in alcohol conditon fair. Statement of type locality of ***I. verdi*** probably erroneous.

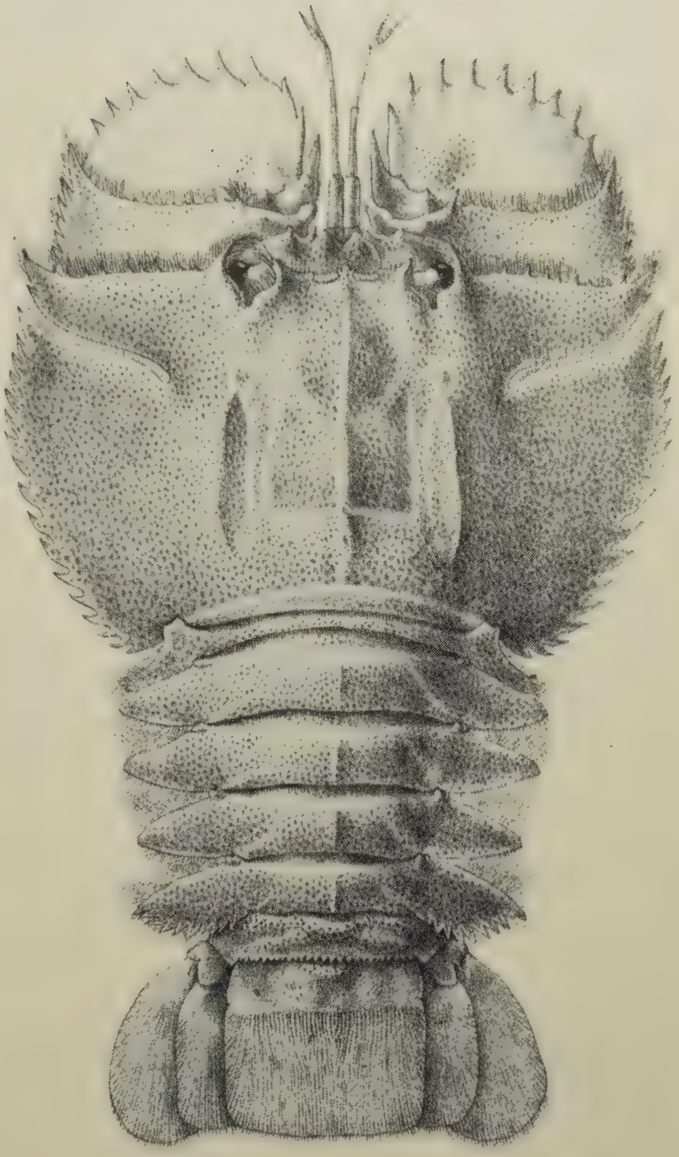
Geographical Distribution : Indo-West Pacific region: South China Sea, Philippines, Moluccas (Indonesia) and New Caledonia (Fig. 385). The record from the Cape Verde Islands almost certainly is erroneous, as no species of the genus has ever been found in the Atlantic.

Habitat and Biology : Known from depths between 186 and 457 m; on smooth substrates: sand, mud or a mixture of the two. The record of 7 to 20 fathoms (= 13-37 m) of the so-called Cape Verde specimens, like the rest of their label, is clearly incorrect.

Size : Carapace length between 2 and 4.5 cm; maximum known total body length about 12 cm.

Interest to Fisheries : So far none. This is a flat, relatively small species, with little meat and it is found only at great depths. Therefore, it is not a promising commercial species.

Literature : Holthuis, 1985:47-52, figs 13,14.



(from Holthuis, 1985)

Fig. 384

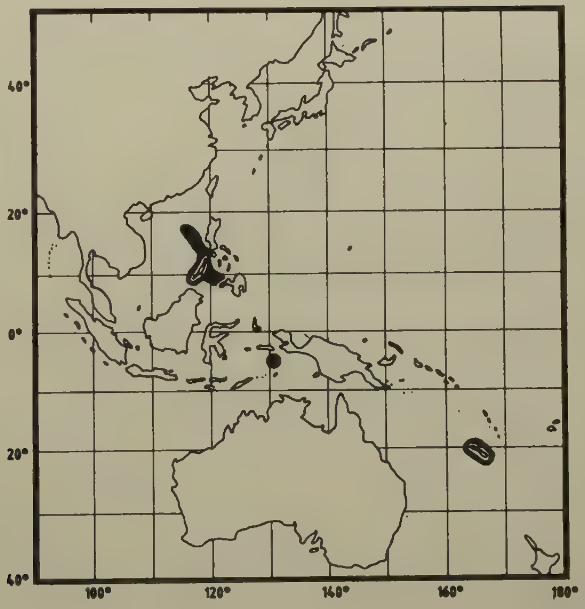


Fig. 385

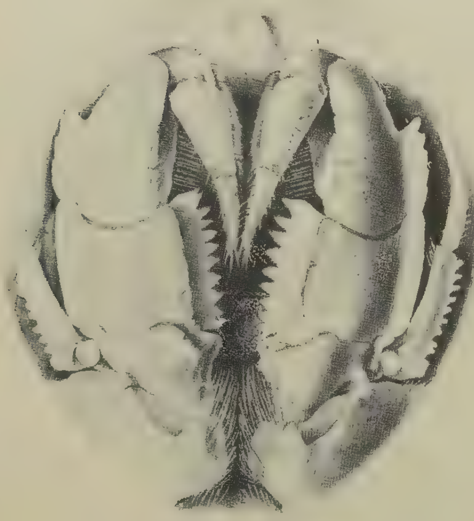
Ibacus brucei Holthuis, 1977

SCYL Ib 4

Ibacus brucei Holthuis, 1977, Zoologische Mededelingen, Leiden, 52:191, pls 1,2.

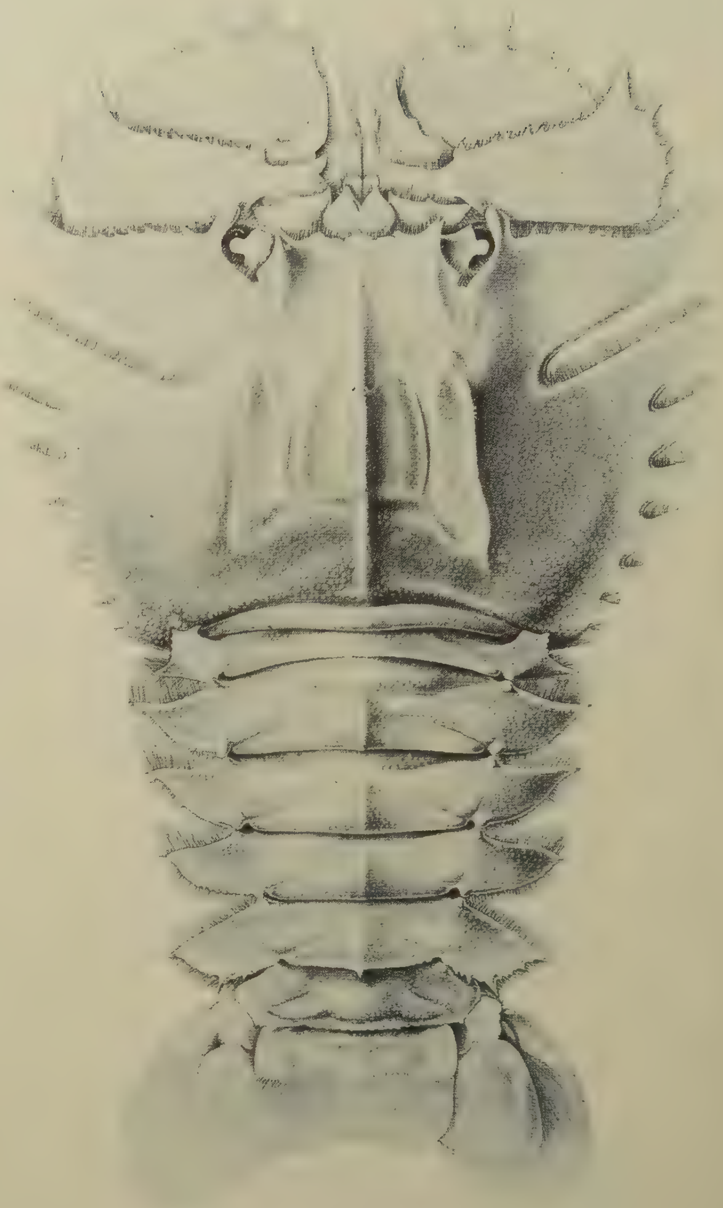
FAO Names : En - Glabrous fan lobster.

Type : Type locality: "Due east of Point Lookout, North Stradbroke Island, Queensland; 86 fathoms (= 157 m)". Male holotype in RMNH, no. D 24744.



mouth field (ventral view)

Fig. 386



(from Holthuis, 1985)

Fig. 386

Geographical Distribution : Australia (Queensland, New South Wales) and New Zealand (Kermadec Islands) (Fig. 387).

Habitat and Biology : Depth range from 90 to 183 m; substrates soft with stones.

Size : The carapace length of the known specimens varies between 2 and 5.7 cm; the maximum total body length being about 13 cm.

Interest to Fisheries : So far none. As the species lives on trawlable grounds (all the types were obtained by trawl), it might be possible that, if the right fishing grounds are found, the species could become commercially important.

Literature : Holthuis, 1985:41-47, figs 10-12.

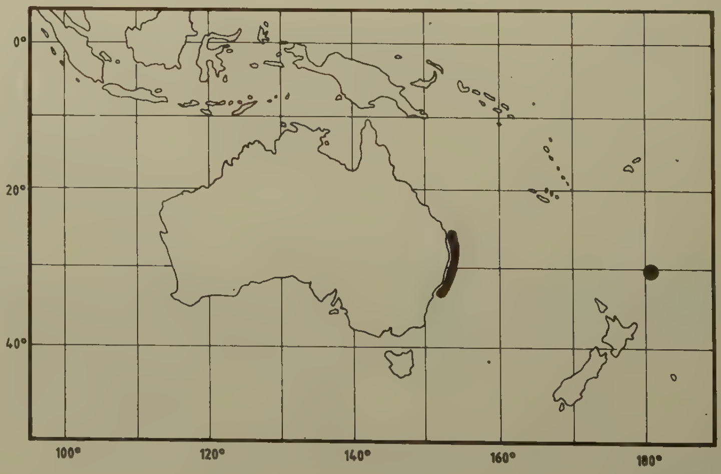


Fig. 387

Ibacus ciliatus (Von Siebold, 1824)

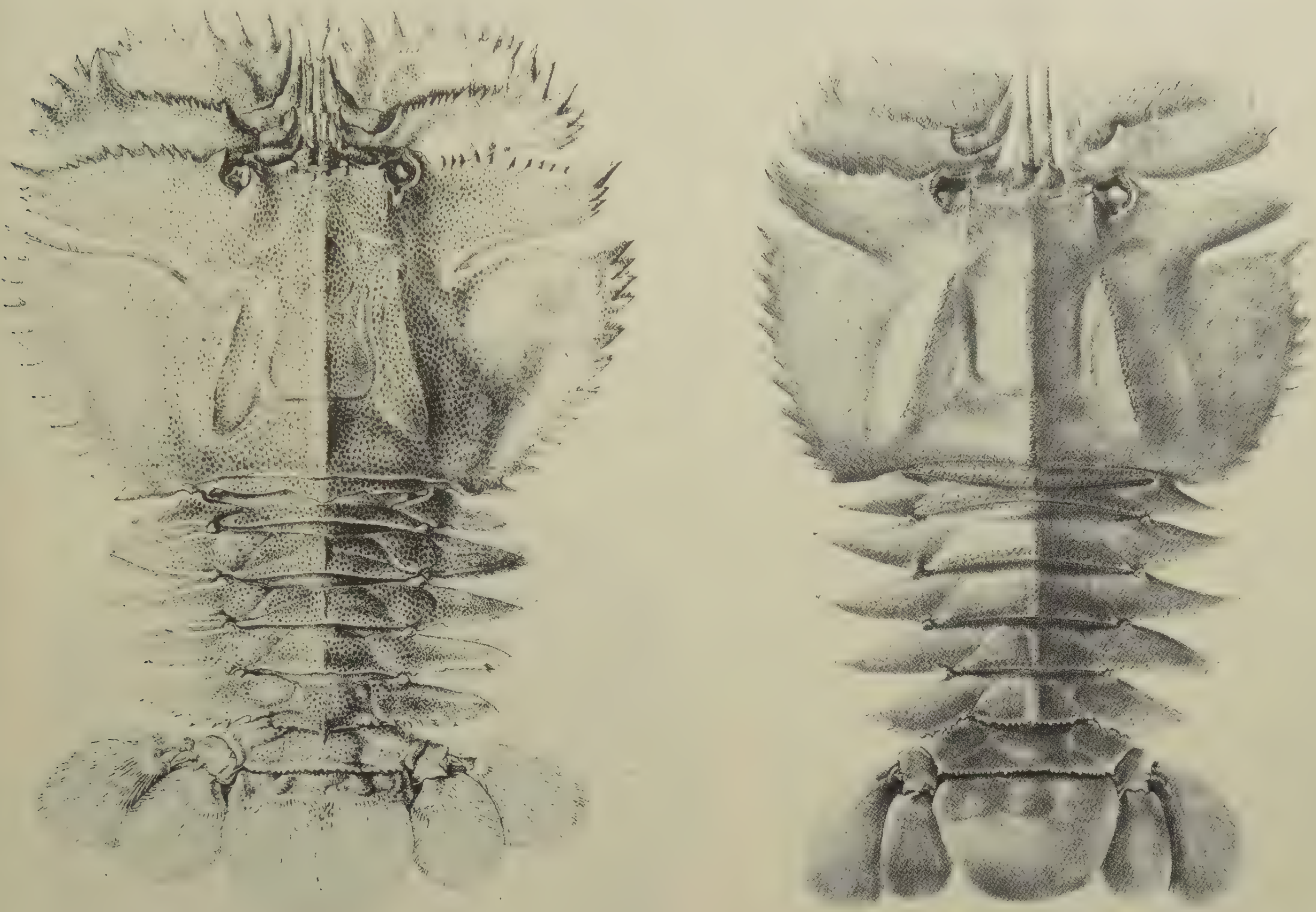
Fig. 388

SCYL Ib 5

Scyllarus ciliatus Von Siebold, 1824, De Historiae Naturalis in Japonia statu: 15.

Synonyms: ***Phyllosoma guerini*** De Haan, 1849; ***Ibacus pictus*** Vilanova y Piera, 1875; ***Phyllosoma utivaebi*** Tokioka, 1954; ***Ibacus ciliatus pubescens*** Holthuis, 1960.

FAO Names : **En** - Japanese fan lobster.



a. *I. ciliatus ciliatus* (male) (from Holthuis, 1985) b. *I. ciliatus pubescens* (old male) Fig. 388

Type : Type locality of ***Scyllarus ciliatus:*** "Japonia", probably near Nagasaki, Kyushu; lectotype in RMNH, no. D 969, in alcohol, condition good.

Type locality of ***Phyllosoma guerini***: "Japonia", probably near Nagasaki, Kyushu; lectotype in RMNH, no. D. 5588, dry, condition poor.

Type locality of ***Ibacu pictus***: "en las aguas del Japon"; whereabouts of type material unknown,

Type locality of ***Phyllosoma utivaebi***: "along the shore near our Laboratory" (= Seto marine biological laboratory, Sirahama, Wakayama-ken, Japan); 3 syntypes in Seto marine biological laboratory.

Type locality of ***I. c. pubescens***: ""Albatross" Station D 5394, near Talajit Island, Philippines, 12°00'30"N, 124°05'36"E"; holotype male in USNM, no. 104285.

Geographical Distribution : Indo-West Pacific region: Japan (southward from Niigata on the west coast (ca. 38°N), and from Tokyo Bay on the east coast (ca. 35.5°N)), south coast of Korea to Hainan Island (S. China), South China Sea, Taiwan, east coast of Philippines and Thailand. The subspecies ***I.c. pubescens*** (Fig. 388b) has been reported from the Philippines (among the islands and along the west coast), and from Western Australia (W. of Broome) (Fig. 389).

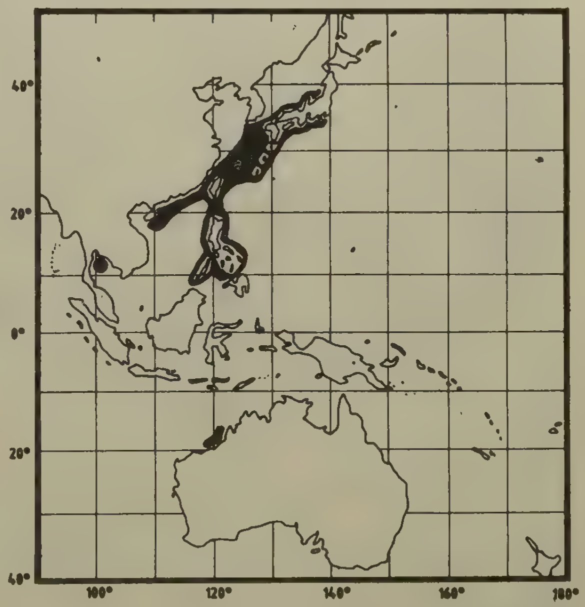


Fig. 389

Habitat and Biology : Depth range from 49 to 314 m, mostly between 100 and 250 m. The species is found on soft substrates of sand, mud or clay.

Size : Maximum total length about 23 cm; the carapace lengths reported are 4 to 7.6 cm (males), 4 to 8 cm (females), 6 to 8 cm (ovigerous females).

Interest to Fisheries : The species is mostly caught by trawlers and sold on the fish markets of Japan, Korea, Taiwan and the Philippines. A report by H. Bürger from about 1830 mentioned that the species could be found every day on the fish markets of Nagasaki and nearby area (Holthuis & Sakai, 1970:112).

Local Names : JAPAN: Uchiwa-ebi, Utiva-ebi, Kai rô, Takuma-ebi; PHILIPPINES: Cupapa, Pitik-pitik; THAILAND: Kung kradan deng.

Literature : Holthuis, 1985:24-36, figs 5-8.

Ibacus novemdentatus Gibbes, 1850

Fig. 390

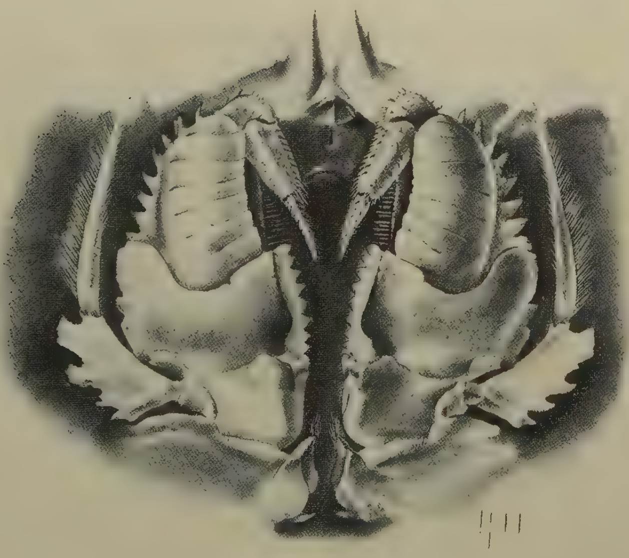
SCYL Ib 1

Ibacus novemdentatus Gibbes, 1850, Proceedings American Association Advancement Science, 3:19.

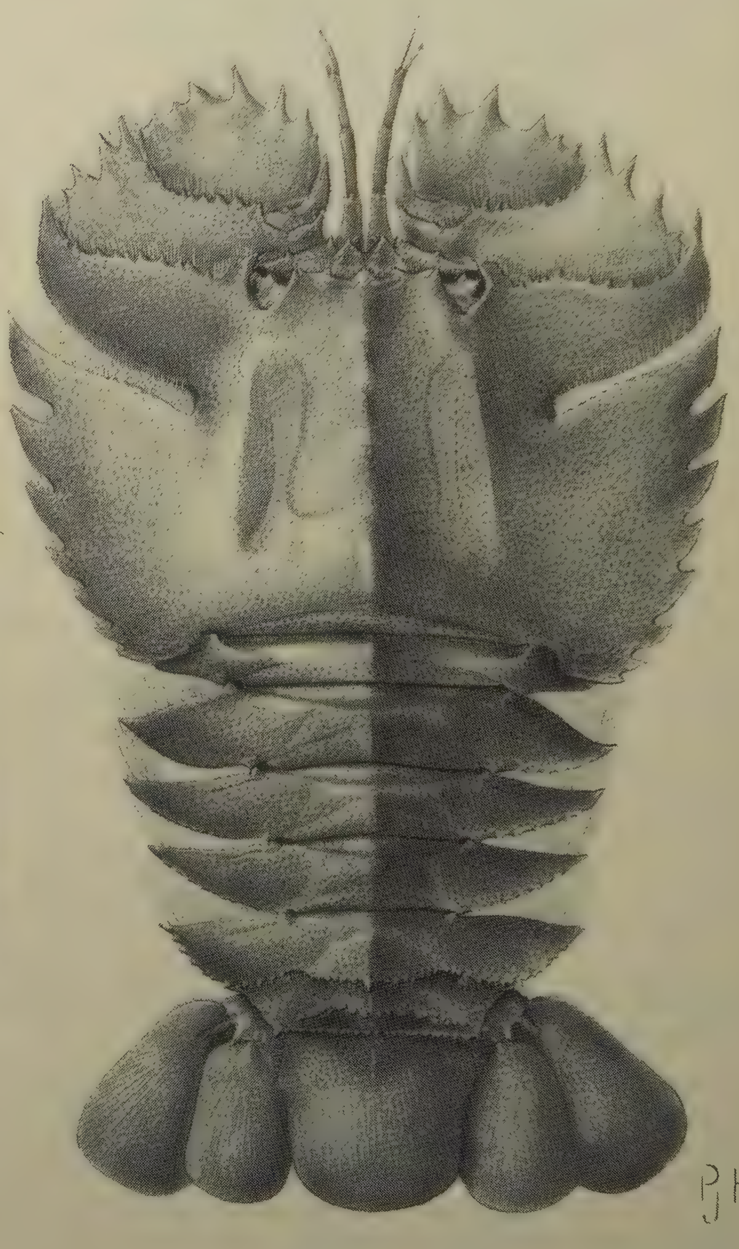
Synonyms: Sometimes confused with ***I. ciliatus*** or ***I. peronii***.

FAO Names : **En** - Smooth fan lobster; **Fr** - Cigale glabre; **Sp** - Cigarra liso.

Type : Type locality: unknown. Holotype in "Cabinet .. of the Lyceum of Natural History, of New York", present whereabouts unknown.



mouth field (ventral view)



(from Holthuis, 1985)

Fig. 390

Geographical Distribution : Indo-West Pacific region: East Africa (Kenya to Cape Province), Western Indian Ocean (N.W. Madagascar, Mauritius-Seychelles Ridge), and from Korea and Japan, to the South China Sea, Taiwan, Vietnam, the Philippines and Western Australia (Fig. 391).

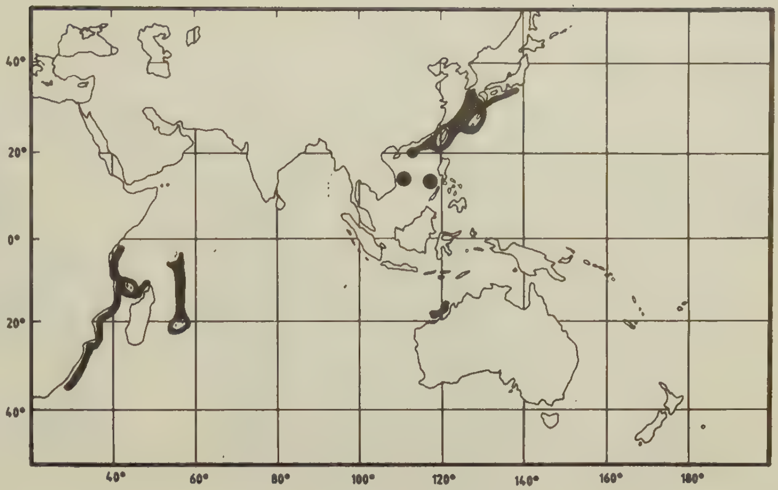


Fig. 391

Habitat and Biology : Depth range from 37 to 400 m; substrates of fine sediments (sand and mud).

Size : Carapace lengths 3 to 7.7 cm; maximum total body length about 19 cm.

Interest to Fisheries : In Korea and Japan, as well as in Taiwan, the species is sold at the markets. In Japan and Taiwan it is obtained by trawlers, in Japan also by long line fishery. Ivanov & Krylov (1980:287) recorded catches of 19.2 kg/hour and 22.6 kg/hour in the western Indian Ocean.

Local Names : JAPAN: Ohba-uchiwa-ebi, Kejirami-gani (Shimane); MOZAMBIQUE: Cava-cava lisa; SOUTH AFRICA: Digging lobster.

Literature : Fischer & Bianchi (eds), 1984:vol. 5; Holthuis, 1985:52-61, figs 15-17.

Ibacus peronii Leach, 1815

Fig. 392

SCYL Ib 6

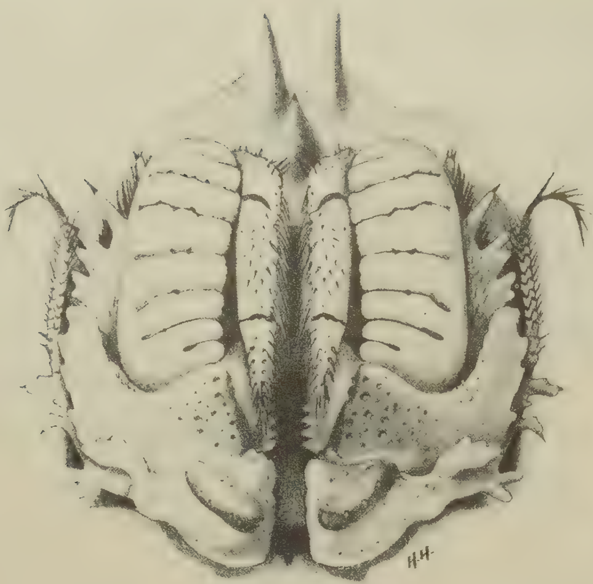
Ibacus peronii Leach, 1815, Zoological Miscellany, 2:152, pl. 119. Name placed on Official List of Specific Names in Zoology in Opinion 519 (published in 1958).

Synonyms: ***Scyllarus incisus*** Leach, 1815; ? ***Phyllosoma duperreyi*** Guérin, 1829.

FAO Names : En - Butterfly fan lobster.

Type : Type locality of ***I. peronii*** and ***S. incisus***: "New Holland" (= Australia). Manuscript notes in the Museum d'Histoire naturelle in Le Havre, France, show that the actual type locality is King Island, Tasmania, 39°50'S 144°00'E. Holotype in MP, no. Pa 146, dry, in good condition.

Type locality of ***Phyllosoma duperreyi***: "Port Jackson", Sydney, New South Wales, Australia; type in MP, no longer extant.



mouth field (ventral view)

Geographical Distribution : S.W., S. and S.E. coasts of Australia from Geraldton (Western Australia) to Southport (S.E. Queensland) (Fig. 393).

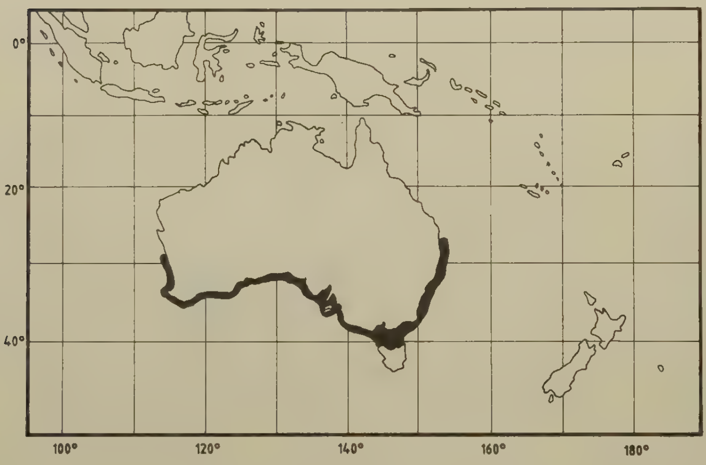
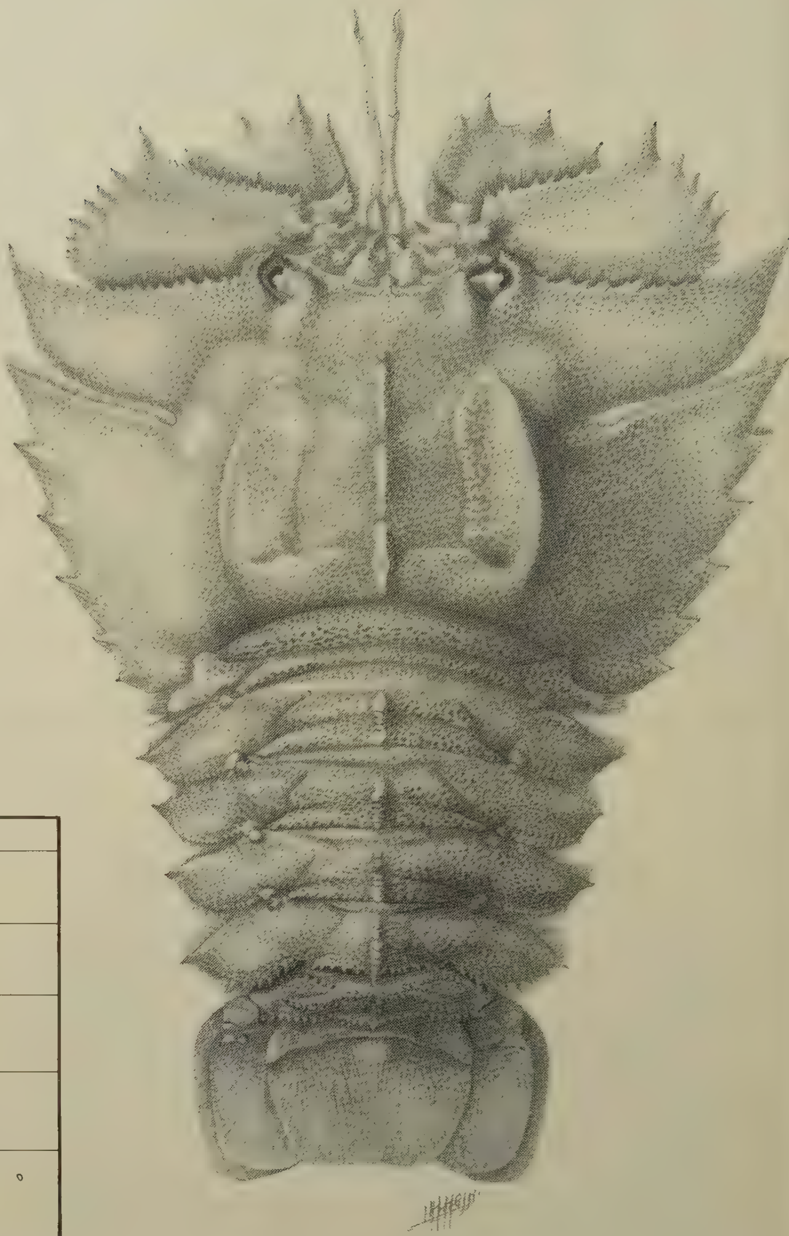


Fig. 393



(from Holthuis, 1985)

Fig. 392

Habitat and Biology : Depth range from 40 to 250 m; on soft substrates of sand or sand and mud. Larvae obtained from the plankton.

Size : Carapace length between 2 and 8 cm, maximum total length about 23 cm.

Interest to Fisheries : Regularly fished and almost always present at Sydney market. The species is taken by prawn trawls. Some fishermen go out specifically to catch "bugs", and sometimes over 100 kg is brought in per day. Dakin, Bennett & Pope (1969:184) observed that "it has quite a good flavour when cooked", but Grant (1978:685) found that its flesh "sometimes tastes and smells strongly of garlic" and that it therefore is considered inferior to ***Thenus.***

Local Names : AUSTRALIA: Balmain bug, Butterfly lobster, Flapjack, Péron's Ibacus crab, Prawn-killer, Sand crayfish, Sand lobster, Southern shovel-nosed lobster, Squagga.

Literature : Holthuis, 1985:61-69, figs 18-20.

Parribacus Dana, 1852

Parribacus Dana, 1852, Proceedings Academy Natural Sciences Philadelphia, 6:14. Gender masculine. Name placed on the Official List of Generic Names in Zoology by the International Commission on Zoological Nomenclature in their Opinion 519 published in 1958.

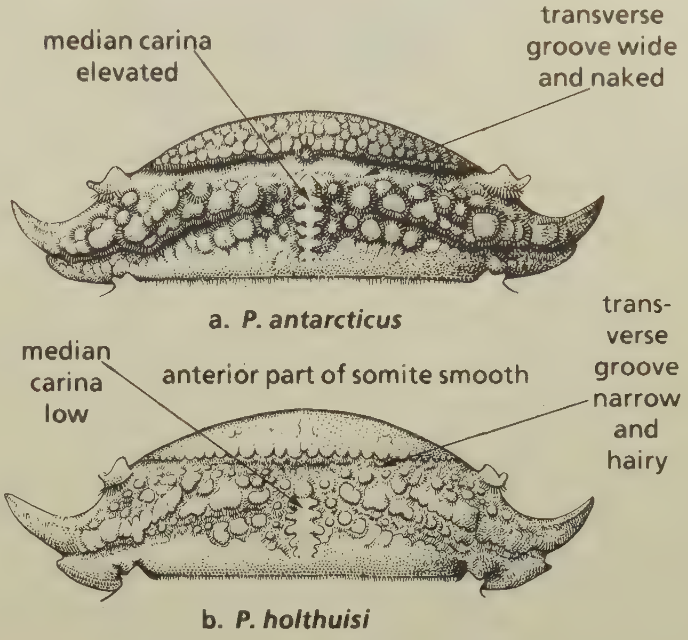
Type Species: selected by Ward (1942:61): ***Scyllarus antarcticus*** Lund, 1793.

The genus contains 6 species, all of which are used as food, but all are only of local interest.

Key to Species:

1a. The transverse groove which separates the anterior from the posterior part of the abdominal somites and which in the fully stretched animal forms the anteriormost part of the visible portion of the somites, is wide and naked, bearing at most a few hairs and tubercles in the median area. The anterior part of the second to third abdominal somites, situated before the just-mentioned groove, bears distinct tubercles. The median carinae of the second and third abdominal somites are elevated (Fig. 394a). The lateral margin of the fourth segment of the antenna as a rule bears six teeth (exclusive of the apical tooth). The two lateral teeth before the cervical incision are of almost equal size (Fig. 395), Indo-West Pacific and West Indian regions .... ***P. antarcticus*** (Fig. 401)

1b. The transverse groove which separates the two parts of the abdominal somites is narrower and filled with many short hairs. The median carinae of the second and third abdominal somites are usually almost level with the surface of the somites (Fig. 394b). The posterior of the two lateral teeth of the carapace before the cervical incision is always smaller than the first (Fig. 396), Indo-West Pacific

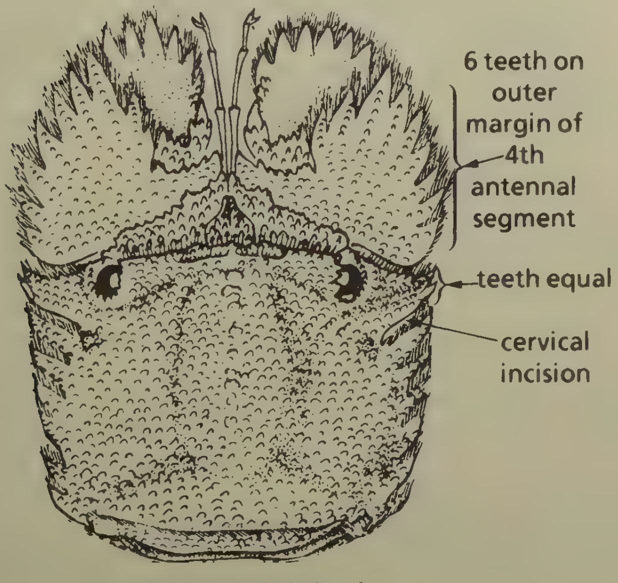


median carina elevated
transverse groove wide and naked
median carina low
anterior part of somite smooth
trans-verse groove narrow and hairy

a. ***P. antarcticus***

b. ***P. holthuisi***

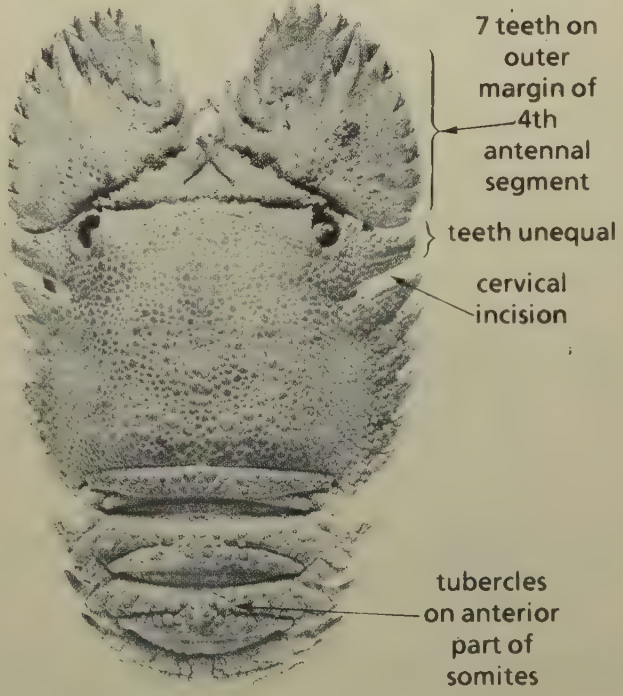
third abdominal somite (dorsal view) Fig. 394
(after Forest, 1954)



6 teeth on outer margin of 4th antennal segment
teeth equal
cervical incision

carapace (dorsal view)

P. antarcticus Fig. 395



7 teeth on outer margin of 4th antennal segment
teeth unequal
cervical incision
tubercles on anterior part of somites

dorsal view
P. caledonicus

Fig. 396

2a. The anterior part of the second to fifth abdominal somites, which disappears under the previous somite when the abdomen is fully stretched, carries distinct tubercles (Figs 396, 397). Fourth segment of antenna with 6 or 7 teeth on the outer margin (apical tooth not included). Legs short and robust

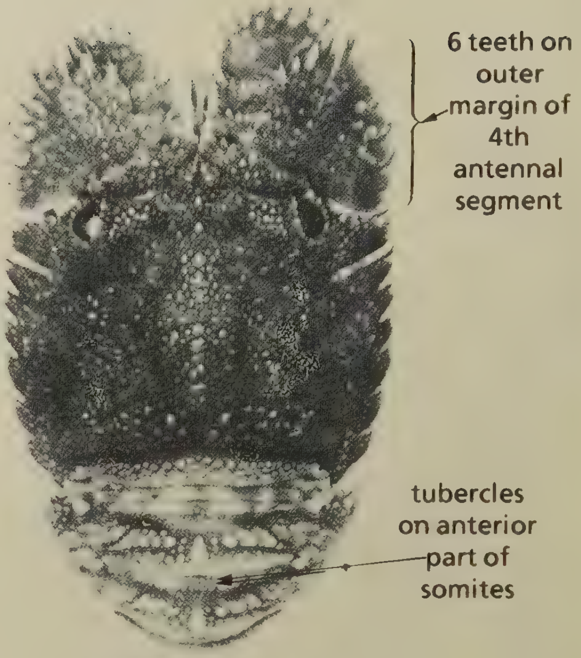
3a. Fourth segment of antenna with seven teeth on the outer margin (apical tooth not included). Squamiform tubercles on upper surface of carapace blunt and appressed (Fig. 396) (Queensland, New Caledonia, Loyalty Islands, New Hebrides and Fiji) .... ***P. caledonicus*** (Fig. 403)

3b. Fourth segment of antenna with six teeth on the outer margin (apical tooth no included). Squamiform tubercles on upper surface of carapace pointed and not appressed (Fig. 397) (Easter Island) .... ***P. perlatus*** (Fig. 409)

2b. The anterior part of the second to fifth abdominal somites smooth or with a reticular pattern of shallow and narrow grooves (Fig. 394b). Fourth segment of antenna as a rule with 5 or 6 teeth on the outer margin. Legs more slender

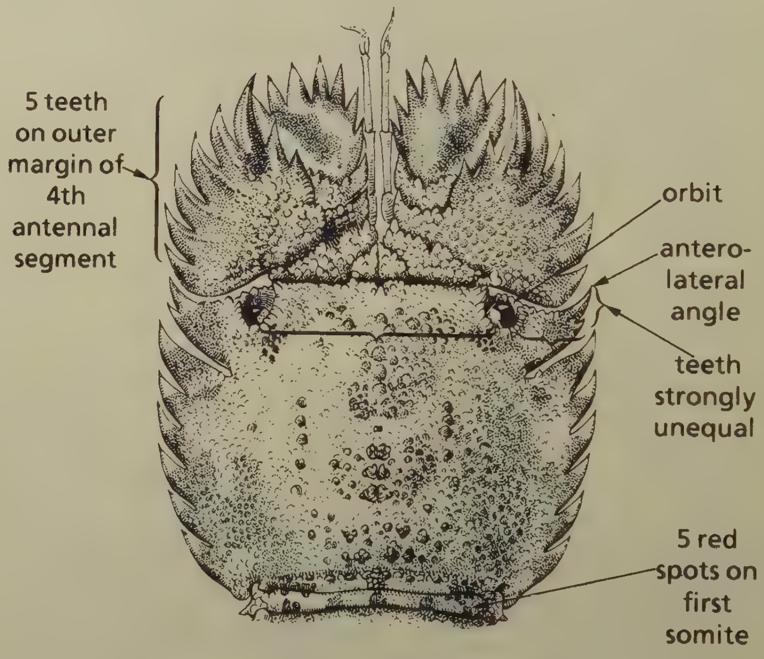
4a. Distance between the orbit and the anterolateral angle of the carapace more than 2/5 of the distance between the two orbits; outer margin of second segment of antenna as a rule with five teeth. The posterior of the two lateral teeth of the carapace before the cervical incision much smaller than the first. First abdominal somite with five red, sharply defined spots on the posterior margin, and a row of smaller spots which is placed more anteriorly (Fig. 398) .... ***P. holthuisi*** (Fig. 405)

4b. Distance between the orbit and the anterolateral angle of the carapace 2/5 or less than 2/5 of the distance between the two orbits. The posterior of the two lateral teeth of the carapace before the cervical incision smaller, but not very much smaller than the anterior. The first abdominal somite with 3 to 5 not very sharply defined spots on the posterior margin: no second row of spots is present (Figs 399, 400)


6 teeth on outer margin of 4th antennal segment
tubercles on anterior part of somites

dorsal view
P. perlatus

Fig. 397

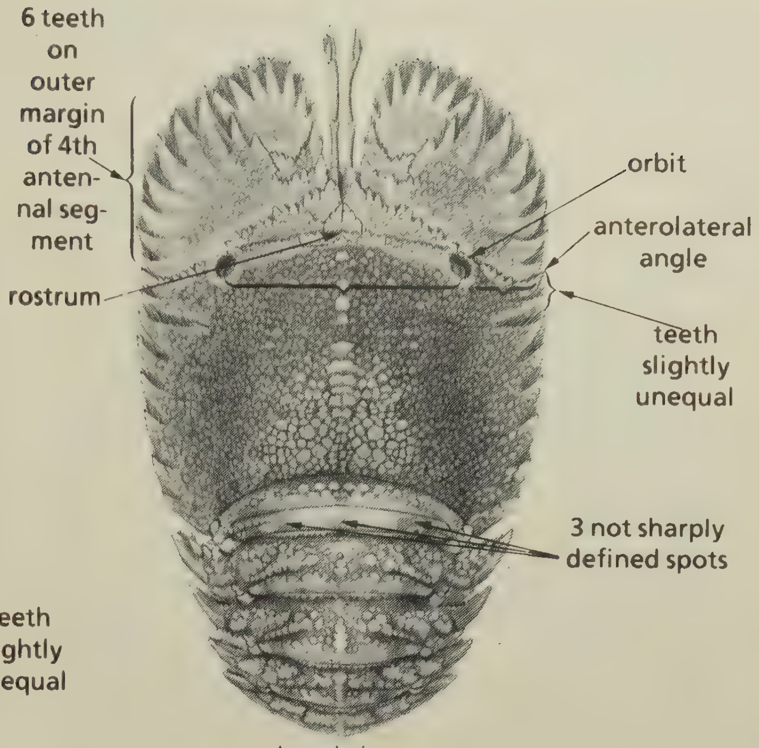

5 teeth on outer margin of 4th antennal segment
orbit
antero-lateral angle
teeth strongly unequal
5 red spots on first somite

carapace and first somite (dorsal view)
P. holthuisi

Fig. 398

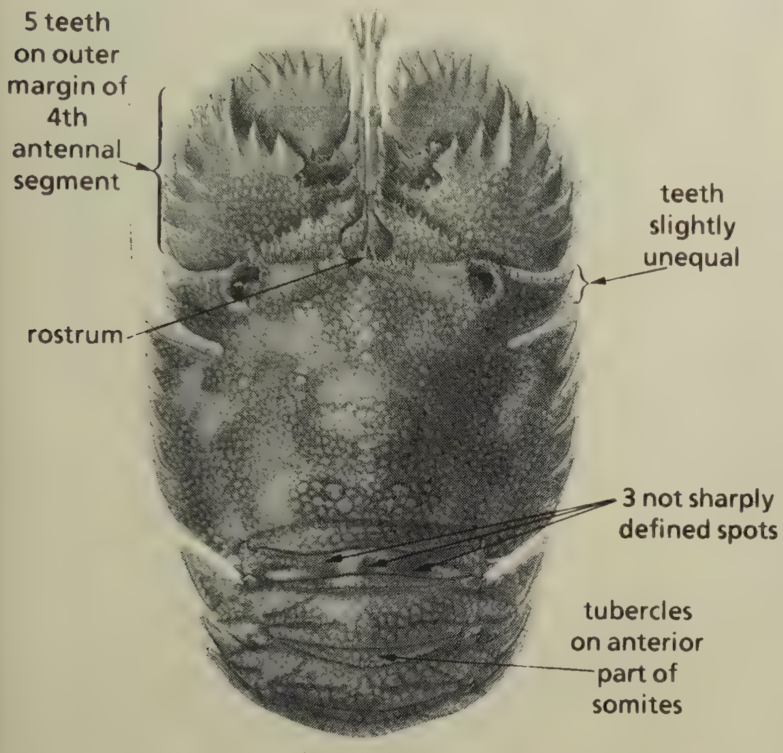
5a. Rostrum with a dorsal rostral tooth. Outer margin of second segment of antenna as a rule with six teeth (Fig. 399) .... ***P. scarlatinus*** (Fig. 411)

5b. Rostrum without a dorsal rostral tooth. Outer margin of second segment of antenna as a rule with five teeth (Fig. 400) .... ***P. japonicus*** (Fig. 407)


6 teeth on outer margin of 4th antennal segment
orbit
anterolateral angle
rostrum
teeth slightly unequal
3 not sharply defined spots

dorsal view
P. scarlatinus

Fig. 399


5 teeth on outer margin of 4th antennal segment
teeth slightly unequal
rostrum
3 not sharply defined spots
tubercles on anterior part of somites

dorsal view
P. japonicus

Fig. 400

Parribacus antarcticus (Lund, 1793)

Fig. 401

SCYL Par 1

Scyllarus antarcticus Lund, 1793, K.Danske Videnskabers Selskab Skrifter, (n.ser.) 2(2):22. Name placed on the Official List of Specific Names in Zoology, in Opinion 519 (published in 1958).

Synonyms: ***Cancer (Astacus) ursus major*** Herbst, 1793; ? ***Scyllarus carinatus*** Guilding, 1825; ***Ibacus ciliatus*** Guilding, 1825; ***Ibacus parrae*** H. Milne Edwards, 1837; ***Ibacus antarcticus*** - H. Milne Edwards, 1837; ***Parribacus parrae*** - Dana, 1852; ***Scyllarus (Ibacus) parrae*** - Herklots, 1861; ***Parribacus antarcticus carinatus*** Pfeffer, 1881; ***Parribacus papyraceus*** Rathbun, 1906; ***Parribacus ursus major*** - De Man, 1916; ***Cancer barffi*** Curtiss, 1938.

FAO Names : En - Sculptured mitten lobster; **Fr** - Cigale savate; **Sp** - Cigarra chinesa.

Type : Type locality of ***Scyllarus antarcticus***: not cited in the original publication, but by the lectotype selection of the specimen figured by Rumphius (1705) (see Holthuis, 1956:111) it is restricted to Amboina, Moluccas, Indonesia. Type specimen no longer extant.

Type locality of ***Cancer (Astacus) ursus major***: "Das Vaterland ist Japan", through Herbst's references to Rumphius (1705) and Seba (1759), Amboina also belongs to the type localities, and through the lectotype selection for this species by Holthuis (1956:111) of the animal figured by Rumphius, Amboina has become the restricted type locality.

The lectotype specimen of *C. ursus major* being the same as that of ***S. antarcticus*** the two names are objective synonyms. Herbst's own paratype is no longer extant.

Type locality of ***Scyllarus carinatus*** Guilding: "in mari Caribeo", probably near St. Vincent. Depository of type unknown.

Type locality of ***Ibacus ciliatus*** Guilding: "in Caribeo mari", probably near St. Vincent. Depository of type unknown.

Type locality of ***Ibacus parrae***: "les Antilles", restricted to Cuba by Holthuis (1985:73); 2 syntypes in MP, nos Pa 409 and 465, dry, in good condition.

Type locality of ***P. antarcticus carinatus***: "Südsee" (South Pacific). Holotype male in ZMH.

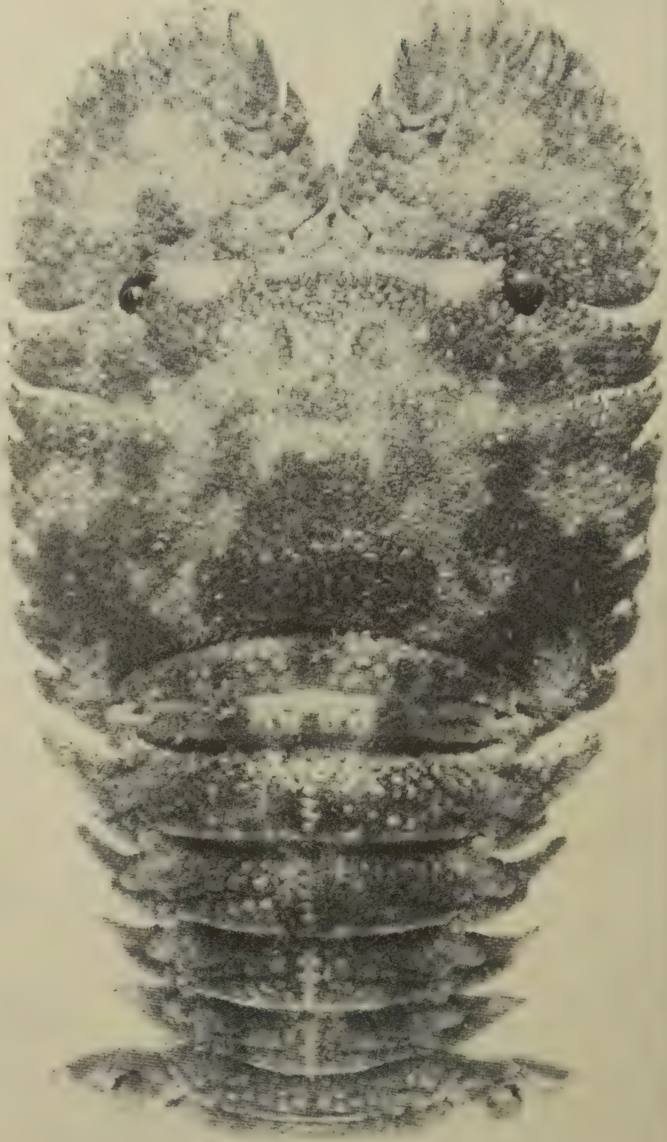
Type locality of ***Parribacus papyraceus***: "South coast of Molokai Island", Hawaiian Archipelago. Lectotype male in USNM, no. 30265.

Type locality of ***Cancer barffi***: "On the barrier reef at Tautira", Tahiti. Depository of type unknown.

Geographical Distribution : Western Atlantic region: from Florida to N.E. Brazil (Bahia), including the West Indian islands and the mainland coast of the Caribbean Sea. Indo-West Pacific region: E. and S.E. Africa to Hawaii and Polynesia (Fig. 402).

Habitat and Biology : Taken at depths from 0 to 20 m; in coral or stone reefs with a sandy bottom. The species is nocturnal and in the daytime hides in crevices, sometimes in small groups.

Size : Carapace lengths between 2 and 9 cm; maximum total length about 20 cm.



(from Holthuis, 1985) Fig. 401

Interest to Fisheries : The species is of excellent taste and eaten where it occurs. It is usually hunted at night on the reefs with torch light. The animals are taken with dipnets or speared or taken by hand There is no special fishery for it on a commercial scale, but it is sometimes taken in nets set for spiny lobsters. Although its taste is usually highly praised and considered better than that of other lobsters, the species is considered too small and the abdomen to flat to become of commercial interest. It is sold fresh or cooked and used for local consumption. At Phuket Island, Thailand, specimens, mounted in fancy glass cases, are occasionally sold to tourists.

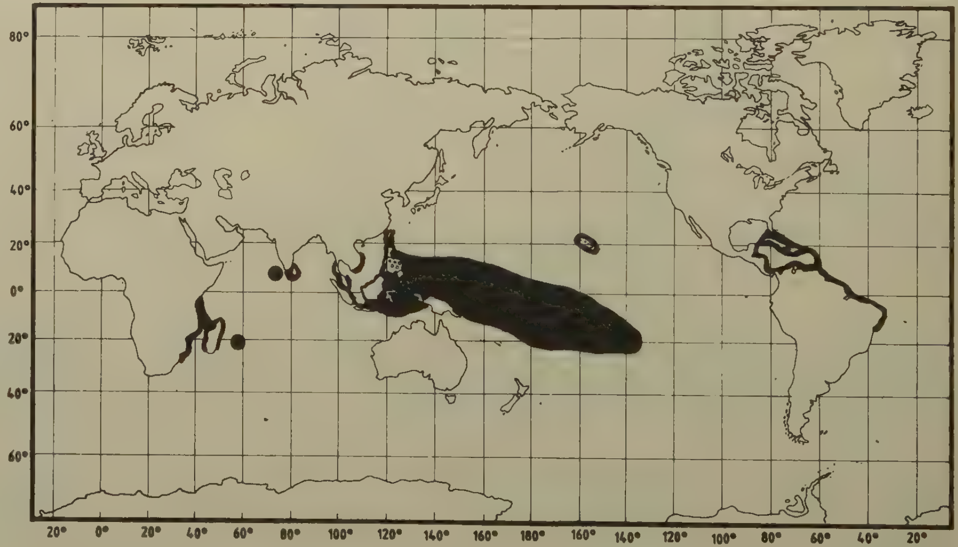


Fig. 402

Local Names : BARBADOS: Horseshoe crab ; BRAZIL: Chineza, Potiquiquyixe (Recife, 17th century); CAROLINE IS.: Allpap; CUBA: Langostino; HAWAII: Ula-pápapa; INDONESIA: Udang laut lebar, Miyu uhut, Ketam gonosso, Udang pasir laut, Uhut; JAMAICA: Sea cockroach; KAPINGAMARANGI: Tapa tapa; KIRIBATI: Te Mnawa; MALAYSIA: Udang laut lebar; MANGAREVA: Kopapa; MARTINIQUE: Savate, Maman homard, Marie-carogne; MARSHALL IS.: Jipukpuk, Uraber; MOZAMBIQUE: Cava-cava esculpida; PALAU: Braber; REUNION: Cigale de mer, Taille de boeuf; SAMOA: Papata; TAHITI: Tianée; THAILAND: Kung kamayi; TUVALU: Tappa tappa.

Literature : Fischer (ed), 1978: vol. 6; Fischer & Bianchi (eds), 1984:vol. 5; Holthuis, 1985:73-88, figs 21, 25A.

Parribacus caledonicus Holthuis, 1960

SCYL Par 2

Parribacus caledonicus Holthuis, 1960, Proceedings Biological Society Washington, 73:147.

Synonyms: Formerly not distinguished from ***P. antarcticus***.

FAO Names : **En** - Caledonian mitten lobster

Type : Type locality: "Ile des Pins", New Caledonia. Holotype female in RMNH, no. D 14506.

Geographical Distribution : Indo-West Pacific region: Queensland, Australia; New Caledonia and Loyalty Islands; New Hebrides; Fiji Islands; Samoa (Fig. 404).

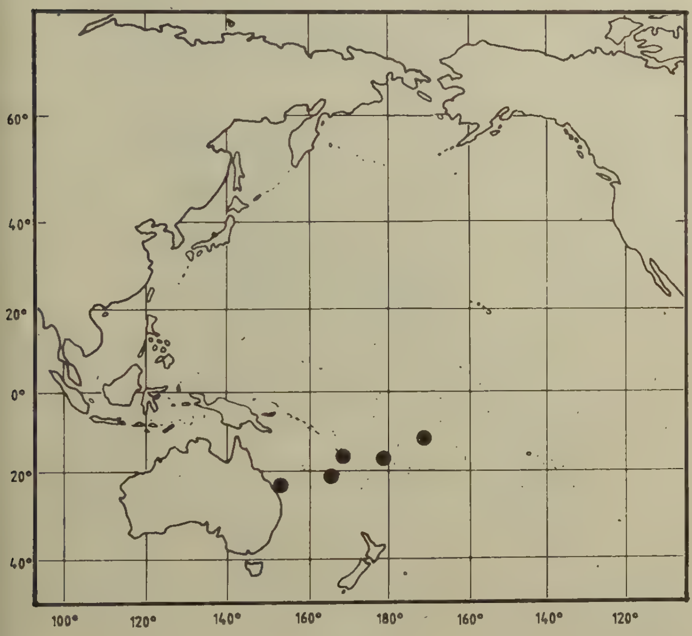
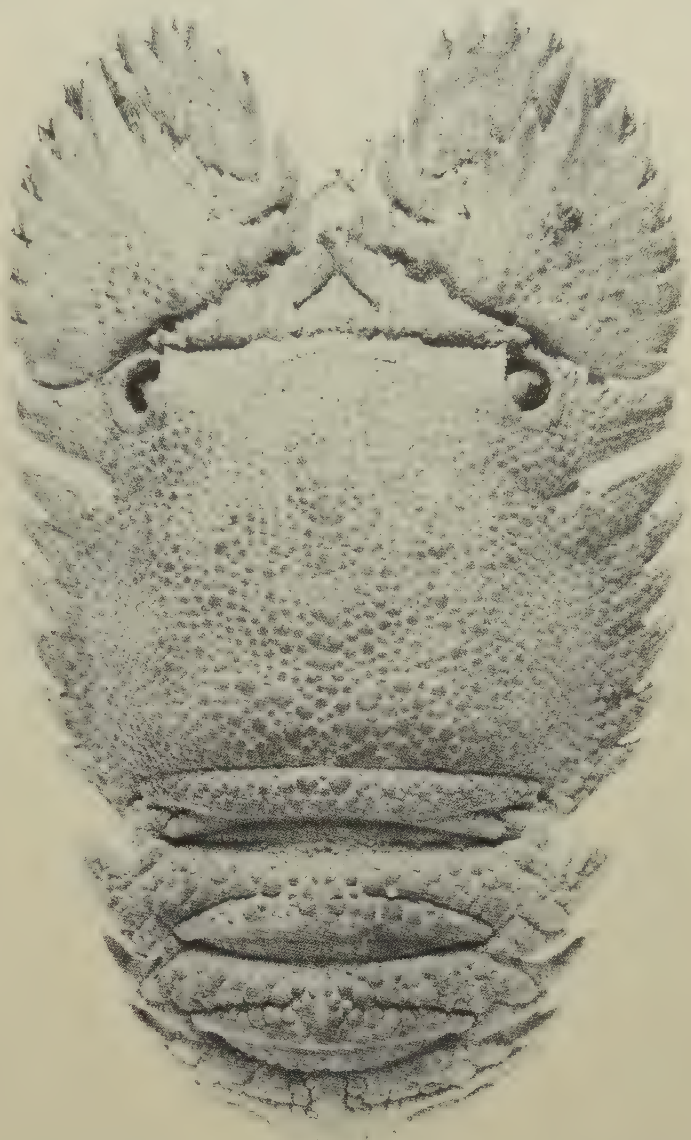


Fig. 404

Fig. 403



(from Holthuis, 1985)

Fig. 403

Habitat and Biology : In shallow water on reefs, usually on the exposed side, often in surge channels. The animals hide in crevices and marine caves in the day time, often attached to the ceilings of the caves.

Size : The carapace length varies between 4.5 and 8 cm; maximum total body length is about 18 cm.

Interest to Fisheries : The species is caught by divers with gloved hands (George, 1971:4). They are eaten and found on the local markets, where they are sold fresh. According to George (1971:9) in Samoa the species is "not in demand by the hotel trade".

Local Names : FIJI: Butterfly lobster, Ivinibila, Vavaba; NEW CALEDONIA: Popinée.

Literature : Holthuis, 1985:88-93, fig. 22.

Parribacus holthuisi Forest, 1954

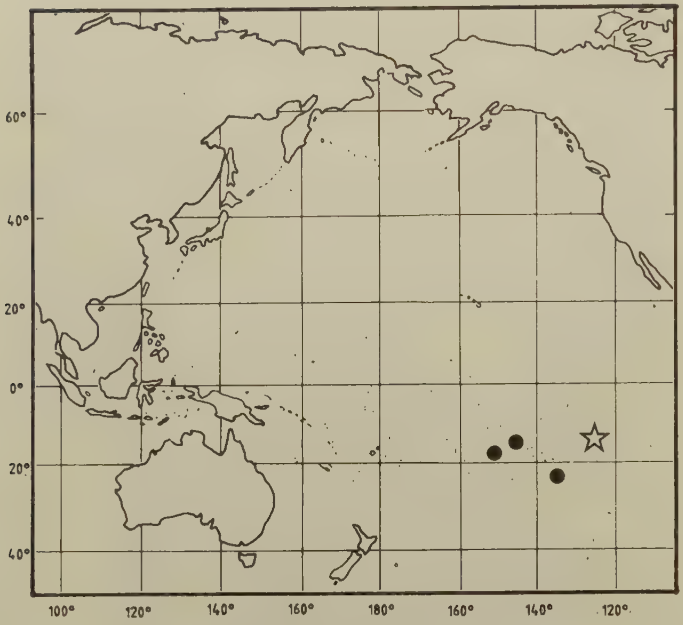
Fig. 405

Parribacus holthuisi Forest, 1954, Bulletin Muséum National Histoire naturelle, Paris, (2)26:346, figs 25, 26B.

FAO Names : En - Red-spotted mitten lobster.

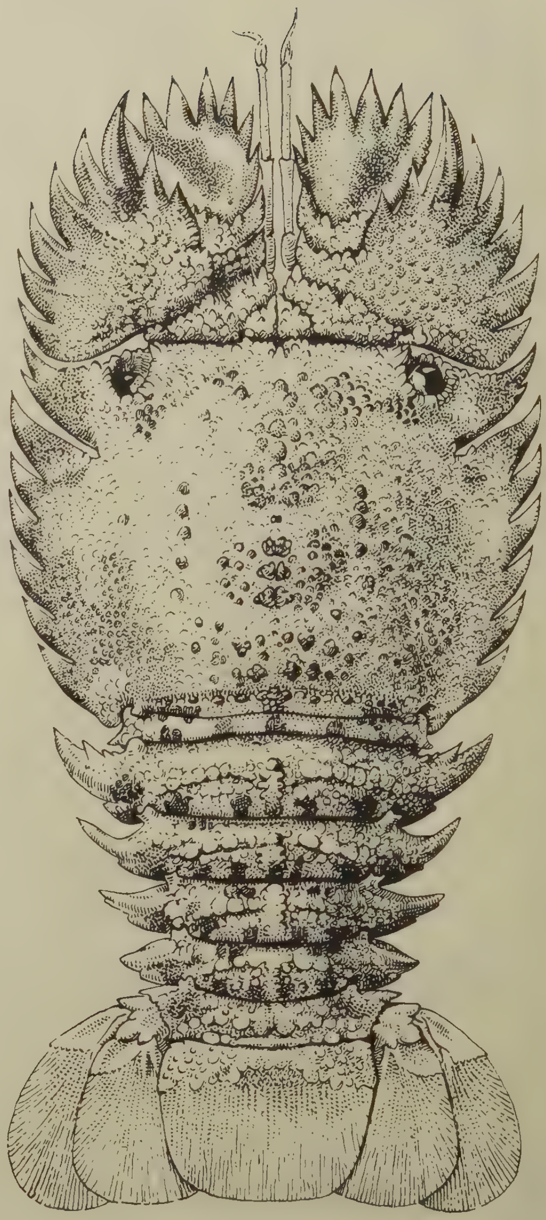
Type : Type locality: "Hikueru", Tuamotu Archipelago. Lectotype female in MP no. Pa 141; paralectotypes in MP and RMNH, all types preserved in alcohol, condition excellent.

Geographical Distribution : The species is only known from the Society, Tuamotu and Gambier Islands in the southern Pacific. A larva, possibly belonging to this species, was reported from 14°13.6'S 126°00'W, in the Pacific Ocean (Fig. 406).



☆ larval record possibly of this species

Fig. 406



(after Forest, 1954)

Fig. 405

Habitat and Biology : In shallow water on the sandy bottom of coral reefs.

Size : Carapace lengths measured vary from 2.5 to 6.5 cm; maximum total length about 14 cm.

Interest to Fisheries : Minor. Used as food by the natives and collected at night with torches.

Local Names : GAMBIER IS.: Akamaru, Opapa; TAHITI: Tianée.

Literature : Holthuis, 1985:98-102, figs 24, 25B.

Parribacus japonicus Holthuis, 1960

Fig. 407

Parribacus japonicus Holthuis, 1960, Proceedings Biological Society Washington, 73:148.

Synonyms: Formerly often confused with ***P. antarcticus.***

FAO Names : **En** - Japanese mitten lobster.

Type : Type locality: "Kururi District, Tokyo Bay", Honshu, Japan. Holotype male in USNM, no. 18883. Paratypes in RMNH, USNM.

Geographical Distribution : Japan (north-west coast, west of Maizuru, 135°15'E; Pacific coast from Tokyo Bay, 140°E, south-westward to Ryukyu Islands) (Fig. 408).

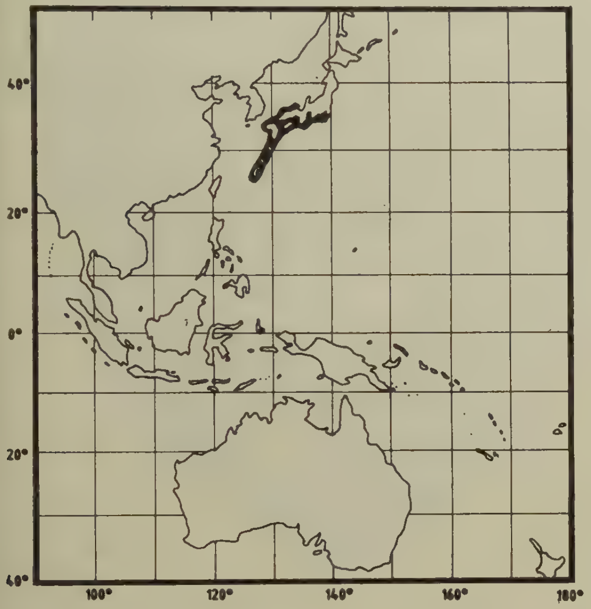
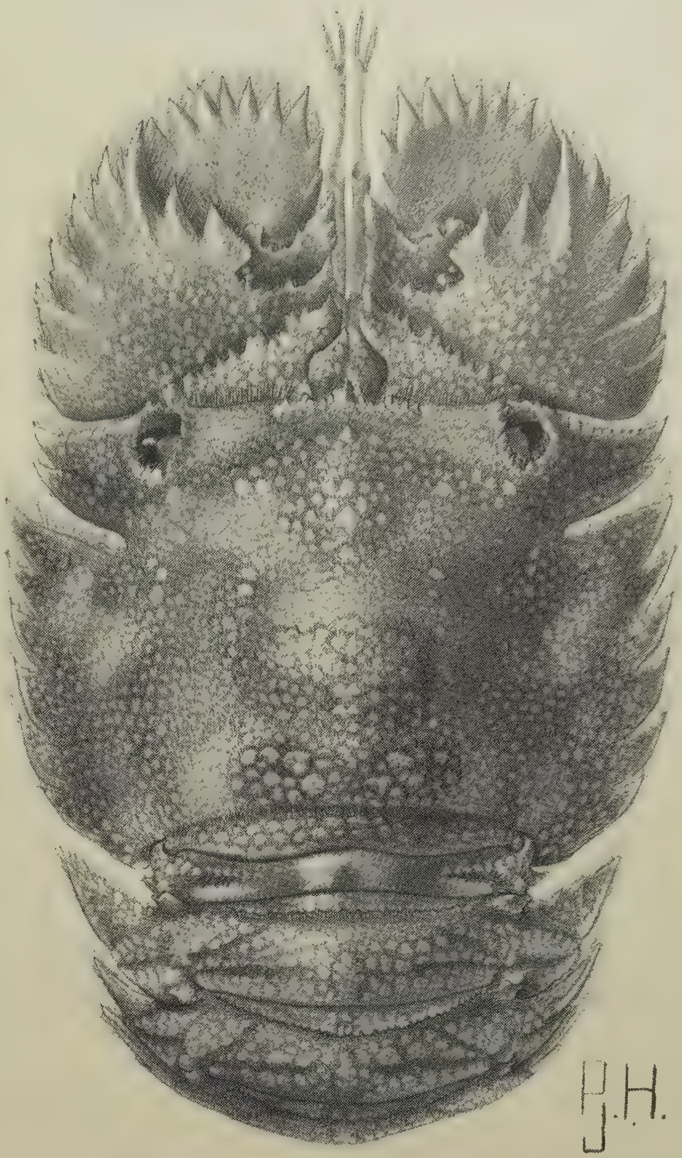


Fig. 408



(from Holthuis, 1985)

Fig. 407

Habitat and Biology : In shallow waters up to 20 m depth; the animals live on shore reefs

Size : Carapace lengths from 4 to 7.4 cm; maximum total body length about 16 cm.

Interest to Fisheries : Minor. The species is caught in gill nets and is sold fresh. Very little information is available.

Local Names : JAPAN: Zori ebi.

Literature : Holthuis, 1985:106-111, fig. 27

Parribacus perlatus Holthuis, 1967

Fig. 409

SCYL Par 5

Parribacus perlatus Holthuis, 1967, Proceedings Koninklijke Nederlandse Akademie Wetenschappen, (C)70:305.

FAO Names : En - Easter Island mitten lobster.

Type : Type locality: "Easter Island" Holotype female in RMNH, no. D 21257, in alcohol, condition excellent.

Geographical Distribution : So far only known from Easter Island, Pacific Ocean (Fig. 410).

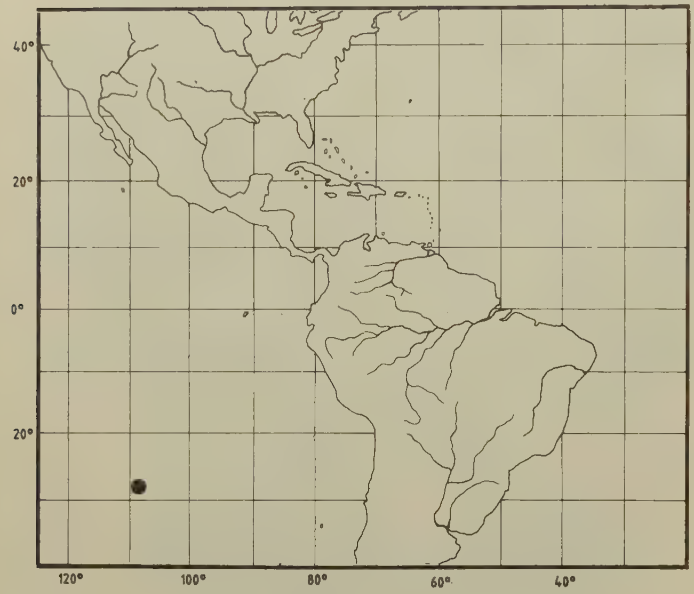
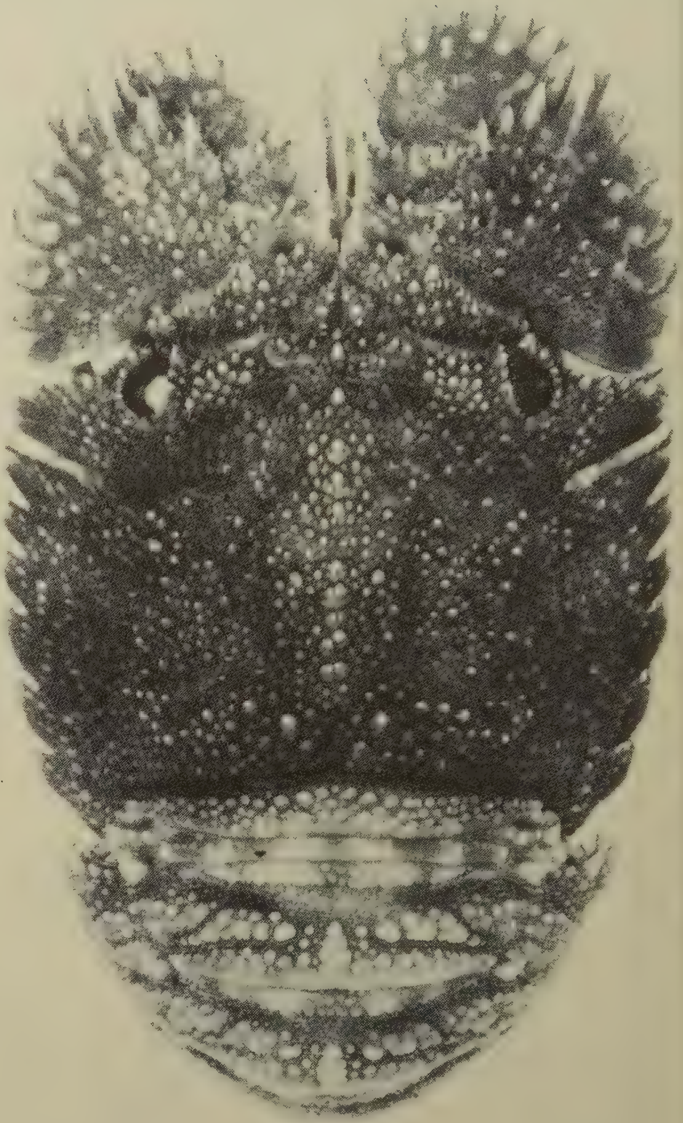


Fig. 410



(from Holthuis, 1985)

Fig. 409

Habitat and Biology : In shallow water among the rocks, the animals hide in the daytime in marine caves and crevices.

Size : Carapace length 4 to 5 cm. Maximum total body length about 11 cm.

Interest to Fisheries : The species is fished by the population of Easter Island by wading in the water both at night and in the daytime. The lobsters are stepped upon and then picked up by hand; divers enter the caves and crevices and pick them up there. At night the fishery takes place with torches.

Local Names : CHILE: Raperape, Ura, Ura raperape, Crayfish, Langosta, Easter Island lobster (Easter Island).

Literature : Holthuis, 1972:44, pl. 1; Holthuis, 1985:93-98, fig. 23.

Parribacus scarlatinus Holthuis, 1960

Fig. 411

SCYL Par 6

Parribacus scarlatinus Holthuis, 1960, Proceedings Biological Society Washington, 73:148.

FAO Names : En - Marbled mitten lobster.

Type : Type locality: "Enderbury Island, Phoenix Archipelago, 3°08'29.7"S, 171°05'34.4"W". Holotype male in USNM, no. 100826.

Geographical Distribution : Central Pacific Ocean from Kapingamarangi through the Marshall, Gilbert and Phoenix Islands to the Marquesas (Fig. 412).

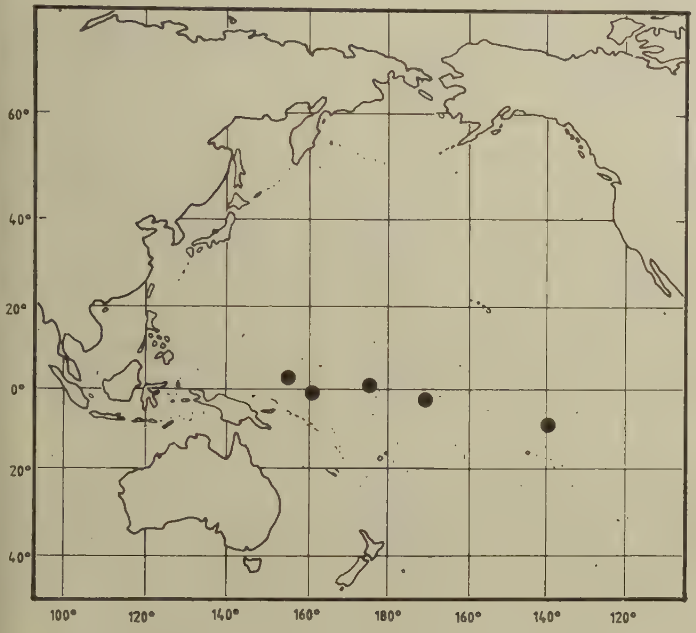
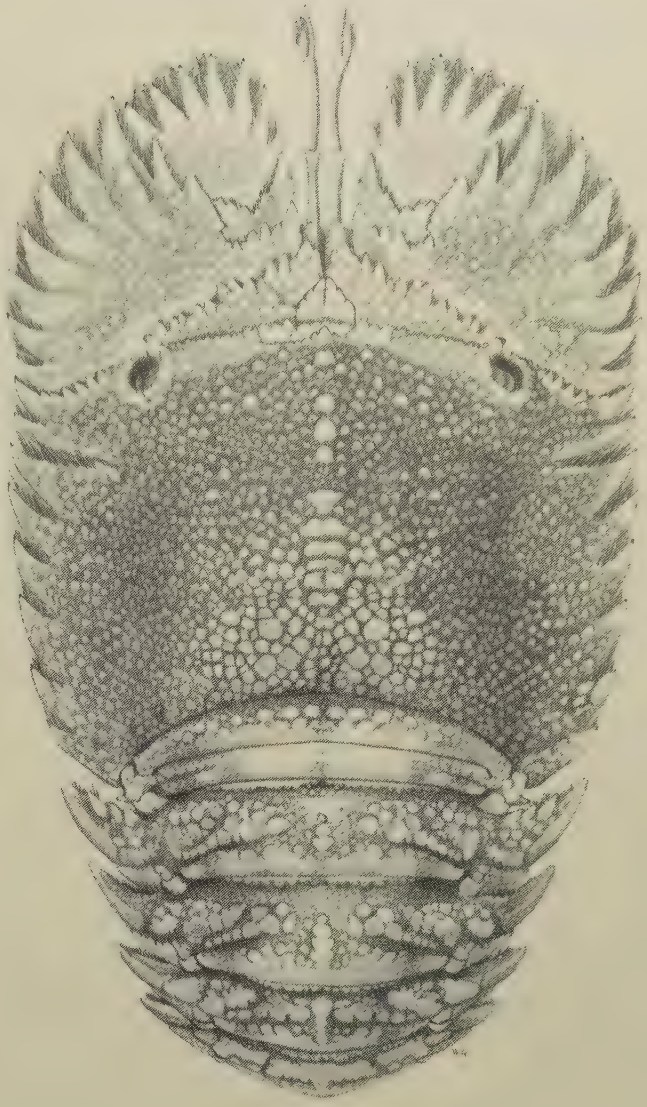


Fig. 412



(from Holthuis, 1985)

Fig. 411

Habitat and Biology : In shallow waters, in or near reefs.

Size : Known carapace lengths vary between 2.5 and 7 cm Maximum total body length about 15 cm.

Interest to Fisheries : No information available, but judging by the fact that all other species of the genus are used as food, the same is expected for the present one.

Literature : Holthuis, 1985:102-106, fig. 26.

SUBFAMILY **SCYLLARINAE** Latreille, 1825

Scyllarides Latreille, 1825, Familles naturelles du Règne Animal:278.

The subfamily Scyllarinae is monotypic, i.e., it contains only the type genus ***Scyllarus***; so far no other genera of Scyllarinae have been described.

Scyllarus Fabricius 1775

SCYL Scylr

Scyllarus Fabricius 1775, Systema Entomologiae:413. Gender masculine. Name placed on the Official List of Generic Names in Zoology by the International Commission on Zoological Nomenclature in their Opinion 519 (published in 1958).

Type Species: by monotypy: ***Cancer arctus*** Linnaeus, 1758.

Synonyms: ***Syllarus*** Rafinesque, 1815, Analyse de la Nature:98. Substitute name for ***Scyllarus*** Fabricius, 1775. Gender masculine.

Chrysoma Risso, 1827, Histoire naturelle de l'Europe méridionale, 5:88. Type species, by monotypy: ***Chrysoma mediterraneum*** Risso, 1827 (a junior subjective synonym of ***Cancer arctus*** L., 1758). Gender neuter.

Arctus De Haan, 1849, in P.F. von Siebold, Fauna Japonica, Crustacea (6,7):xx, 238. Type species, by absolute tautonymy: ***Cancer arctus*** L., 1758. Gender masculine.

Arctus Dana, 1852, Proceedings Academy Natural Sciences Philadelphia, 6:14. Type species by monotypy (and absolute tautonomy): ***Arctus ursus*** Dana, 1852, (= a replacement name for ***Cancer arctus*** L., 1758). Gender masculine.

Nisto Sarato, 1885, Moniteur des étrangers de Nice, 9 (216):3. Type species, by present selection: ***Nisto laevis*** Sarato, 1885 (a junior subjective synonym of ***Cancer arctus*** L., 1758). Gender masculine.

Yalomus Rafinesque in Holthuis, 1985, Zoologische Mededelingen, Leiden, 59(13):141. Type species, by monotypy: ***Yalomus depressus*** Rafinesque in Holthuis, 1985 (a junior subjective synonym of ***Cancer arctus*** L., 1758). Gender masculine.

More than 40 species are known in this genus, they are listed below. Most species are small and of no economic value. A few (only 7 are known to me) have been reported from fish markets, but even those can only be considered as accidental bycatch of other species. Hence, a key to species is not presented here, but short diagnoses are provided for the 7 species reported from fish markets as an aid for their recognition.

List of Species*:

S. aesopius Holthuis, 1960 - Philippines
S. amabilis Holthuis, 1963 - Western Australia
S. americanus (S.I. Smith, 1869) Syn: ***Arctus americanus*** S.I. Smith, 1869; ***Scyllarus gundlachi*** (Von Martens, 1872) - West Central Atlantic
S. aoteanus Powell, 1949 - New Zealand
S. arctus (Linnaeus, 1758) Syn: see p. 217 - East Central Atlantic
S. aureus Holthuis, 1963 - Indo-West Pacific
S. aurora Holthuis, 1982 - Indo-West Pacific
S. batei Holthuis, 1946 Syn: see p. 219 - Indo-West Pacific
S. bertholdii Paulson, 1875 Syn: see p. 221 - Indo-West Pacific
S. bicuspidatus (De Man, 1905) Syn: ***Arctus bicuspidatus*** De Man, 1905 - Indo-West Pacific
S. brevicornis Holthuis, 1946 Syn: see p. 222 - Japan, China
S. caparti Holthuis, 1952 - West Africa
S. chacei Holthuis, 1960 - West Central Atlantic
S. crenatus (Whitelegge, 1900) Syn: ***Arctus crenatus*** Whitelegge, 1900 - Eastern Australia
S. cultrifer (Ortmann, 1897), Syn: subs. ***S.c. meridionalis*** Holthuis, 1960 - Indo-West Pacific
S. delfini (Bouvier, 1909) Syn: ***Arctus delfini*** Bouvier, 1909 - Juan Fernandez, Chile
S. demani Holthuis, 1946 - Indo-West Pacific
S. depressus (S.I. Smith, 1881) Syn: ***Arctus depressus*** S.I. Smith, 1881; ***S. nearctus*** Holthuis, 1960 - West Central Atlantic
S. dubius Holthuis, 1963 - Australia
S. faxoni Bouvier, 1917 - West Central Atlantic

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* This list is still tentative, more new species will be described in the near future.

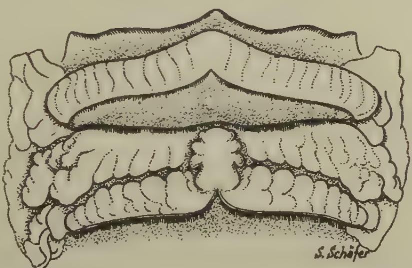
S. gibberosus (De Man, 1905) Syn: **S. sordidus** Nobili, 1905 (not Stimpson, 1860); **Arctus gibberosus** De Man, 1905; **Arctus nobilii** De Man, 1905; **Scyllarus paulsoni** Nobili, 1906; **Scyllarus nitidus** Nobili, 1906; **Scyllarus nobilii** - Nobili, 1906 - Indo-West Pacific
S. kitanoviriosus Harada, 1962 - Japan, Korea
S. lewinsohni Holthuis, 1967 - Red Sea
S. longidactylus Harada, 1962 - Japan
S. martensii Pfeffer, 1881 Syn.: see p. 223 - Indo-West Pacific
S. mawsoni (Bage, 1938) Syn: **Arctus mawsoni** Bage, 1938 - Australia
S. modestus Holthuis, 1960 - Hawaiian Islands
S. ornatus Holthuis, 1960 - Indo-West Pacific
S. paradoxus Miers, 1881 Syn: **S. (Arctus) arctus paradoxus** (Miers, 1881) - West Africa
S. planorbis Holthuis, 1969 - Caribbean Sea
S. posteli Forest, 1963 - East Central Atlantic
S. pumilus Nobili, 1905 Syn: **S. thiriouxi** Bouvier, 1914 - Red Sea, Western Indian Ocean
S. pygmaeus (Bate, 1888) Syn.: see p. 224 - East Central Atlantic
S. rubens (Alcock & Anderson, 1894) Syn: **Arctus rubens** Alcock & Anderson, 1894 - Western Indian Ocean
S. rugosus H. Milne Edwards, 1837 Syn.: see p. 225 - Indo-West Pacific
S. sordidus (Stimpson, 1860) Syn: **Arctus sordidus** Stimpson, 1860 - Indo-West Pacific
S. subarctus Crosnier, 1970 - West Africa
S. timidus Holthuis, 1960 - Indo-West Pacific
S. umbilicatus Holthuis, 1977 - Eastern Australia
S. vitiensis (Dana, 1852) Syn: **Arctus vitiensis** Dana, 1852 - Indo-West Pacific

Scyllarus arctus (Linnaeus, 1758)

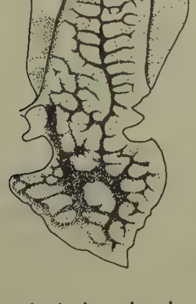
Fig. 413

SCYL Scylr 1

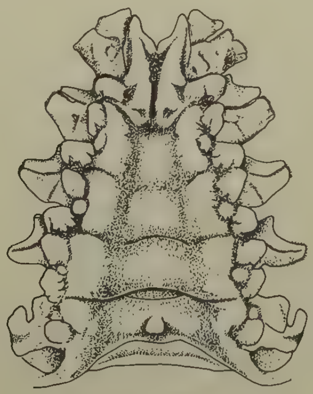
Cancer arctus Linnaeus, 1758, Systema Naturae, (ed.10) 1:633. Name placed on the Official List of Specific Names in Zoology, in Opinion 519 (published in 1958).



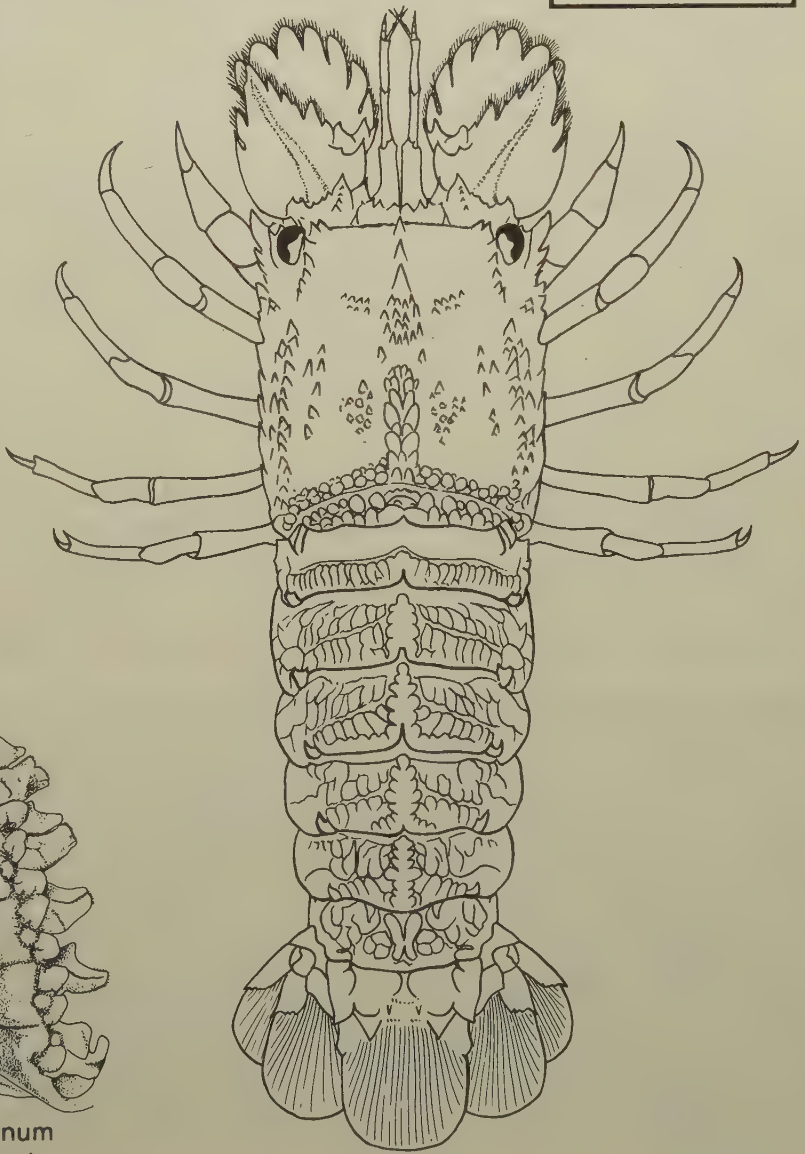
first and second abdominal somites (dorsal view)



second abdominal somite (lateral view)



thoracic sternum (ventral view)



dorsal view

Fig. 413

Synonyms: ***Astacus arctus*** - Pennant, 1777; ***Cancer (Astacus) ursus minor*** Herbst, 1793; ***Scyllarus tridentatus*** Leach, 1814; ***Scyllarus cicada*** Risso, 1816; ***Chrysoma mediterraneum*** Risso, 1827; ***Phyllosoma sarniense*** Lukis, 1835; ***Phyllosoma parthenopaeum*** Costa, 1840; ***Arctus arctus*** - De Haan, 1849; ***Phyllosoma mediterraneum*** - Hope, 1851; ***Arctus ursus*** Dana, 1852; ***Nisto laevis*** Sarato, 1885; ***Nisto asper*** Sarato, 1885; ***Arctus crenulatus*** Bouvier, 1905; ***Scyllarus (Arctus) crenulatus*** - Bouvier, 1915; ***Scyllarus arctus lutea*** Risso MS in Holthuis, 1977; ***Yalomus depressus*** Rafinesque MS in Holthuis, 1985.

FAO Names : En - Small European locust lobster; **Fr** - Petite cigale; **Sp** - Santiaguiño.

Type : Type locality of ***Cancer Arctus*** and ***Arctus ursus*** (the latter is a replacement name for the former): "Habitat in M [ari]. Europae, Asiae, Africae, Americae". As lectotype of the species is now selected the specimen figured by Barrelier (1714:131, fig. 1288 II) as "Squilla Ursa minor altera remipes", the only specimen of the present species cited by Linnaeus (1758). Barrelier's specimen was collected and figured by him during his travels in "Galliam, Hispaniam et Italiam", no exact locality is given, but the type locality may be arbitrarily restricted to Ostia, the port of Rome, as in the second page of Barrelier's biography in the introduction to his 1714 book, it is said that in Ostia he figured marine insects (= Crustacea): "Portum Ostiensem ... Plantas investigandi causâ perlustravit, Marinasque plurimas, Insecta simul & Conchylia depinxit". On p. xxvi of the chapter "Index Iconum Barrelieri" of his book, all the Crustacea, Mollusca and Echinodermata that he figured are listed as "Insecta marina". The lectotype is almost certainly no longer extant, but the figure is so exact that there cannot be any doubt as to the identity of the specimen.

Type locality of ***Cancer (Astacus) ursus minor***: "Man findet diesen Krebs im Mittelländischem Meere". Type material in ZMB, no longer extant.

Type locality of ***Scyllarus tridentatus***: "Its habitat is unknown". The specimen was observed by Leach "in the collection of William Comyns, Esq. of Mount Pleasant, near Dawlish, Devonshire" and thus may have come from the south coast of England. Whereabouts of the type material unknown.

Type locality of ***Scyllarus cicada***: "Environs de Nice", "dans les rochers du litoral". Depository of type material unknown.

Type locality of ***Chrysoma mediterraneum***: "dans nos mers [= seas near Nice, dépt. Alpes Maritimes, S. France]. Depository of types unknown.

Type locality of ***Phyllosoma sarniense***: "on the Coast of Guernsey", Channel Islands, Great Britain. Depository of type unknown.

Type locality of ***Phyllosoma parthenopaeum***: "Trovato a galleggiare nella marina di Capri", near Naples, Italy. Depository of larval holotype unknown.

Type locality of both ***Nisto laevis*** and ***Nisto asper***: "Les deux Nisto ont été decouverts ... dans les eaux de Saint-Jean, près de Nice", dépt. Alpes Maritimes, S. France. Depository of syntypes of either species unknown.

Type locality of ***Arctus crenulatus***: "Porto-Santo (Madère)", later (Bouvier, 1905:2) given more detailed as "de la baie de Porto-Santo ... par 100 mètres de profondeur". Holotype in MOM.

Type locality of ***Scyllarus arctus lutea***: Nice, S. France. Depository of type unknown.

Type locality of ***Yalomus depressus***: "in the Sicilian Seas", Italy. Types lost.

Diagnostic Features: Carapace with 3 distinct acute teeth in the median line before the cervical groove (the gastric, pregastric and rostral teeth). Region between the postrostral and branchial carinae with only a few tubercles, and with extensive smooth areas. Abdomen without a sharp median ridge, but each of somites 2 to 5 with an elongate lobulate figure in the middle. The exposed part of somites 2 to 5 with an arborescent arrangement of very narrow grooves. Somite 1 with a complete transverse groove, behind which there are numerous short longitudinal grooves that are rather irregular in shape, may divide and sometimes are interconnected by transverse grooves; this posterior half of somite 1 of equal length throughout its width, not longer in the middle that at the sides. The smooth anterior half of abdominal somites 2 to 6 (i.e., the part of the somite that disappears under the previous somite when the abdomen is fully stretched) without any indication of grooves or rows of hairs. Fourth segment of antenna with a single oblique median carina. Outer margin of the segment with 2 teeth, the inner margin with 3 or 4 (not including the apical tooth). Thoracic sternum anteriorly V-shapedly incised in the middle. A blunt and low median tubercle on the last thoracic sternite; this tubercle somewhat flattened posteriorly, not conical as in ***S. pygmaeus***. Dactyli of legs without fringes of hair. **Colour**: reddish brown with a dark brown pubescence. A dark brown, not sharply delimited spot in the central part of abdominal somite 1. Segments of the pereiopods with a dark blue band each.

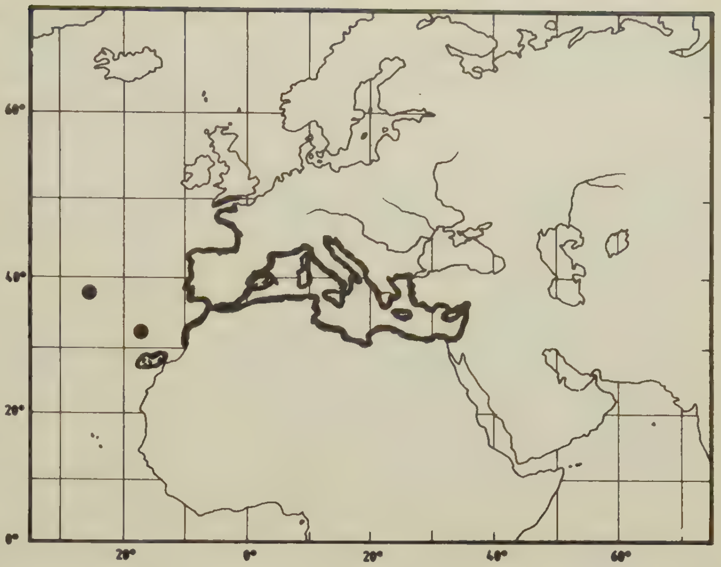


Fig. 414

Geographical Distribution : Eastern Atlantic region from the south coast of the British Islands to the Azores, Madeira and the Canary Islands, as well as the entire Mediterranean (Fig. 414)

Habitat and Biology : Depth range from 4 to 50 m; on rocky or muddy substrates, and also in Posidonia prairies. Ovigerous females from February to April.

Size : Total body length usually between 5 and 10 cm, maximum body length about 16 cm.

Interest to Fisheries : Minor. The species is edible and used as food, but there is no special fishery for it, being usually taken as a by-catch in other fisheries. It has been taken with gill nets, trawls, dredges, traps and seines. It is also taken by hand by divers, who at places seem to have decimated the populations, especially after the introduction of Scuba gear. The animals are offered for sale at local markets, usually fresh. The relatively small size and the fact that it is never abundant make the species economically not very attractive.

Local Names : FRANCE: Petite cigale, Cigale de mer, Petit Scyllare, Chambre (Provence); GERMANY: Kleiner Bärenkrebs, Grillenkrebs; GREECE: Astakoudáki; ISRAEL: Kapavit dubit; ITALY: Cicala di mare, Magnosella; PORTUGAL: Lagosta da pedra, Lameiro; SPAIN: Santiaguiño, Toribio, Cigala; Bujías, Llagosta lluisa, Xuius (Cataluña); Cigarra (Andalucia); TUNISIA: Chkal, Ziz il bahr, Cigale blanche, Petite cigale de mer; UK: Broad lobster; YUGOSLAVIA: Zezavac.

Literature : Palombi & Santarelli, 1961:372 (local names); Fischer, Bianchi & Scott (eds), 1981:vol. 5; Fischer, Bauchot & Schneider (eds), 1987:317-318.

Remarks: The name "Phyllosoma sarniense" is not mentioned in Lukis' (1835:459-464) article, the editor even put in this article on p. 462 a bracketed remark" "Will Mr Lukis please to take an early opportunity of adding a specific epithet". The name is provided in the index to the volume (8) of The Magazine of Natural History in which Lukis' article appeared; on p. 685 of the index is cited "Phyllosòma sarniénse Lukis, and other species, 461".

Scyllarus batei Holthuis, 1946

Fig. 415

SCYL Scylr 3

Scyllarus batei Holthuis, 1946, Temminckia, Leiden, 7:94.

Synonyms: ***Arctus orientalis*** Bate, 1888 (not ***Scyllarus orientalis*** Lund, 1793); ***Scyllarus orientalis*** - De Man, 1916; ***Scyllarus batei arabicus*** Holthuis, 1960.

FAO Names : En - Soft locust lobster; **Fr** - Cigale douce; **Sp** - Cigarra blanducha.

Type : Type locality of ***Arctus orientalis*** and ***S. batei*** (the latter name being a replacement name for the former): "Challenger" "Station 209, between Bohol and Zebu [= Cebu], ... lat. 10°14'N., long. 123°54'E.; depth, 95 fathoms [= 174 m]; bottom, blue mud". Two syntypes in BM.

Type locality of ***S. batei arabicus***: "Gulf of Aden (13°16' - 13°16'36"N 46°20'24"-46°14'E, depth 220 m, "John Murray" Expedition Sta. 194". Holotype in BM, no. 88.22, in alcohol, condition good.

Diagnostic Features : Carapace with 2 distinct teeth in the median line before the cervical groove (the gastric and pregastric teeth), the rostral tooth is absent. The region between the postrostral and branchial carinae with only very few tubercles and extensive smooth areas. Abdomen with a distinct sharp median carina on somites 1 to 5, all these ridges of approximately the same height. Somite 1 with the transverse groove interrupted in the middle by the median carina; behind the groove there are no longitudinal grooves, but a transverse row of tubercles. The exposed part of somites 2 to 5 without an arborescent pattern, but with a wide transverse groove (interrupted in the middle) behind which there is a transverse row of tubercles, and before which there are some tubercles and wide short side grooves. The fourth segment of the antenna has a single, distinct oblique median carina; the upper surface has no additional carina or tubercles. The outer margin of the segment has 2 to 4 larger, the inner margin 4 to 7 smaller teeth (not including the apical tooth). The thoracic sternum with the anterior median end gutter-like sunken, not incised in the middle. No median tubercles on the sternites. Dactyli of legs 3 to 5 with dorsal fringes of hair. **Colour:** body pale brown with the ridges and tubercles pale purple or reddish. First abdominal somite brick red in the anteromedian area (see Chan & Yu, 1986, pls 4, 9A,B).

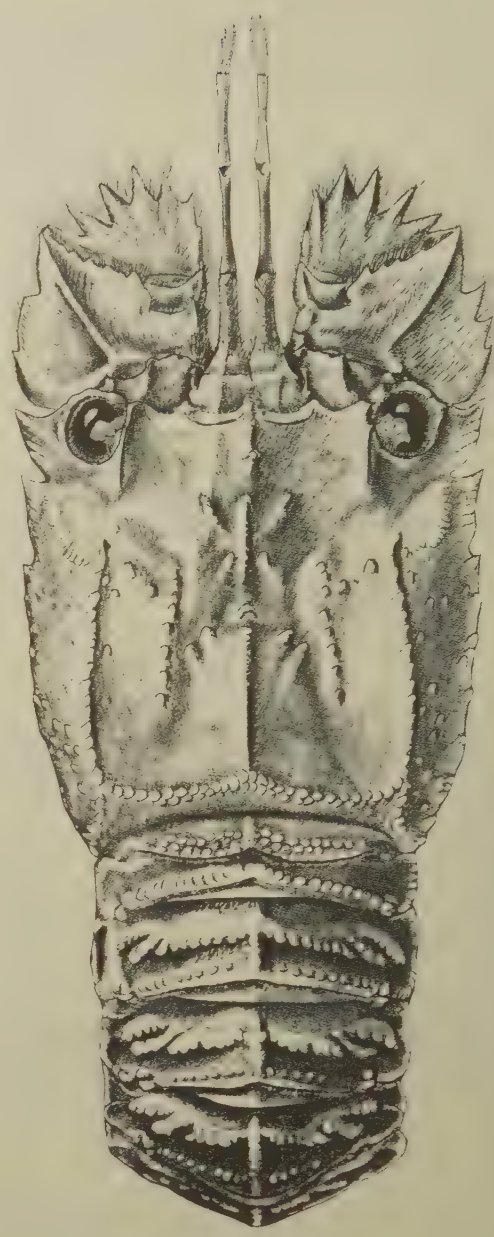


Fig. 415

Geographical Distribution : Indo-West Pacific region: Gulf of Aden and East Africa to the South China Sea, Taiwan, the Philippines and Indonesia. It is possible that the western form is a separate subspecies ***S.b. arabicus*** (Fig. 416).

Habitat and Biology : Depth range from 160 to 484 m, usually between 170 and 210 m; on sandy and muddy substrates.

Size : Maximum total body length about 7 cm, carapace length to 3 cm (males 1.4 to 2.9 cm; females 1.5 to 3.3 cm; ovigerous females 2.3 to 3.1 cm).

Interest to Fisheries : Sometimes taken by trawlers in small quantities (George, 1969:433), the species is not considered to be of potential commercial interest. Chan & Yu (1986:149) reported the species, from local fish markets in Taiwan; the animals were caught with "baby shrimp trawls"

Literature : Fischer & Bianchi (eds), 1984:vol 5; Chan & Yu, 1986:155, pl. 4 fig. A-C, pl. 9 fig. A,B.

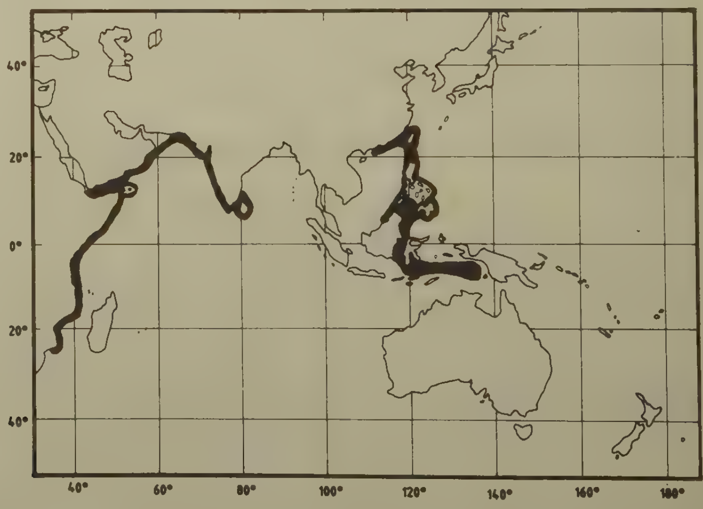


Fig. 416

Scyllarus bertholdii Paulson, 1875

Fig. 417

SCYL Scylr 4

Scyllarus bertholdii Paulson, 1875, Izsledovaniya Rakoobraznykh Krasnago Morya:97.

Synonyms: ***Scyllarus haanii*** Berthold, 1845 (not ***S. haanii*** De Haan, 1841); ***Scyllarus sinensis*** White, 1847 (nomen nudum).

FAO Names : En - Two-spot locust lobster.

Type : Type locality of ***S. bertholdii*** and ***S. haanii*** Berthold (the former being a replacement name for the latter): China. Lectotype female RMNH, no. 5518, dry, condition rather poor. A possible paralectotype in SMF, under no. 7 MG 233. The specimen, a dry female labelled "Mare Indicum", is the only specimen of this species from the collection of the Göttingen Museum now on permanent loan in the Senckenberg Museum. It was not labelled as being a type.

Type locality of ***S. sinensis***: "China". Syntypes in BM.

Diagnostic Features : The teeth in the median line of the carapace low and obscure: the rostral tooth is usually reduced to a mere tubercle, the pregastric tooth is distinct, but low, the gastric tooth is absent; the cardiac tooth (behind the cervical groove) is replaced by 2 low blunt and flattened submedian tubercles. The region between the post-rostral and branchial carinae shows few tubercles and rather large smooth areas. Abdomen without median carina, the median area of the somites is low and flat. The exposed part of the abdominal somites shows an arborescent pattern of narrow grooves. Somite 1 has a complete transverse groove behind which there are numerous parallel oblique grooves, which in the middle of the segment form a triangular figure. Fourth segment of the antenna with a single straight and obliquely directed median carina; no additional carinae or tubercles on the dorsal surface. Outer margin of the segment with two distinct sharp teeth, inner margin with a large single sharp tooth (apical tooth of segment not included). Thoracic sternum with the anterior margin straight and transverse, with a very narrow median incision. The anterior margin forms a broad ridge behind which there is a sunken triangular area. No median tubercles on the sternites. Dactylus of pereiopods 1, 2, 4 and 5 without hairy fringes. **Colour:** the body is reddish brown. Most conspicuous and characteristic are two large dark spots on the first abdominal somite, one on each side slightly above the base of the pleuron. The legs are pale with a few dark bands (see Chan & Yu, 1986, pls. 2, 8B).

Geographical Distribution : Indo-West Pacific region: S. China, Hong Kong, Taiwan, South China Sea, Gulf of Thailand, Philippines, Indonesia, W. and N. Australia (Fig. 418).

Habitat and Biology: Reported from depths between 15 and 150 m, but most common between 40 and 75 m. Found on a soft substrate (mud, sandy mud, muddy sand, sand, coralline algae, etc.).

Size : Maximum total body length 4.2 cm (males), 5.8 cm (females). Carapace length 0.4 to 1.5 cm (males), 0.5 to 2 cm (females, including ovigerous ones).

Interest to Fisheries : The species is caught by trawlers (with "baby shrimp trawls") as a by-catch and so may reach fish markets, e.g. in Taiwan (see Chan & Yu, 1986:149). It is not known whether the animals are sold as food.

Literature : Chan & Yu, 1986:152,pl. 2 Fig A-C, pl 8 fig. B.

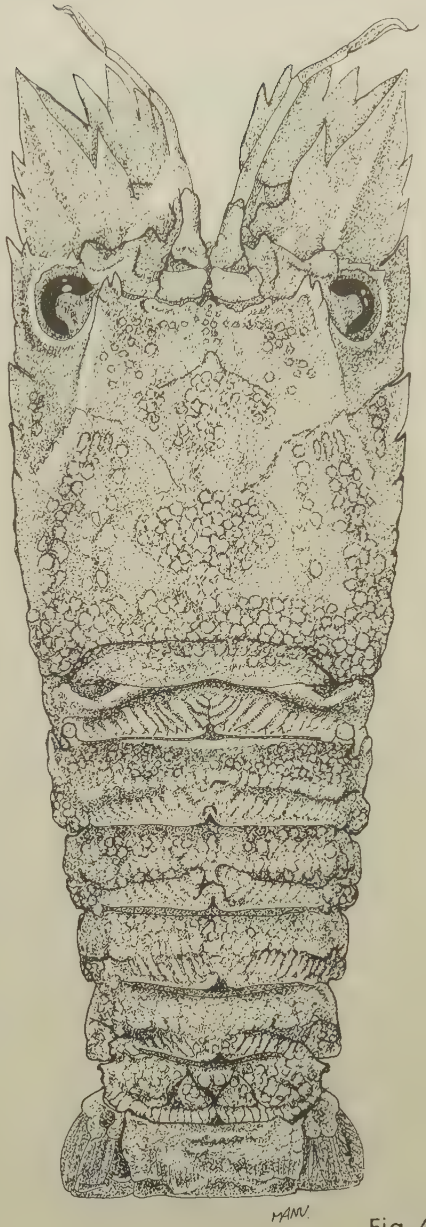


Fig. 417

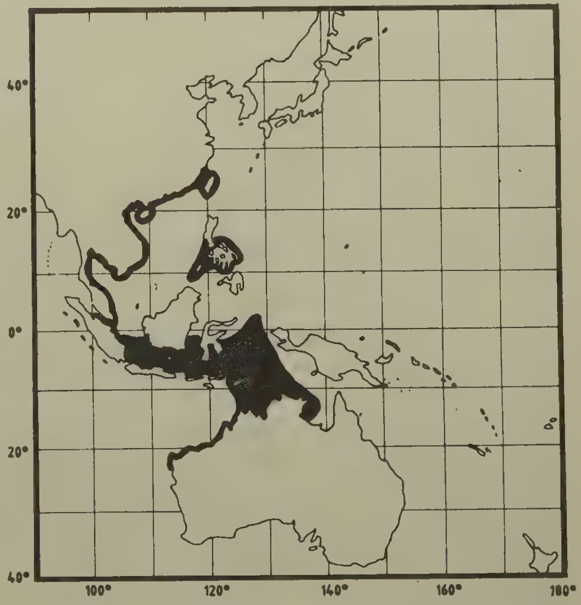


Fig. 418

Scyllarus brevicornis Holthuis, 1946

Fig. 419

SCYL Scylr 5

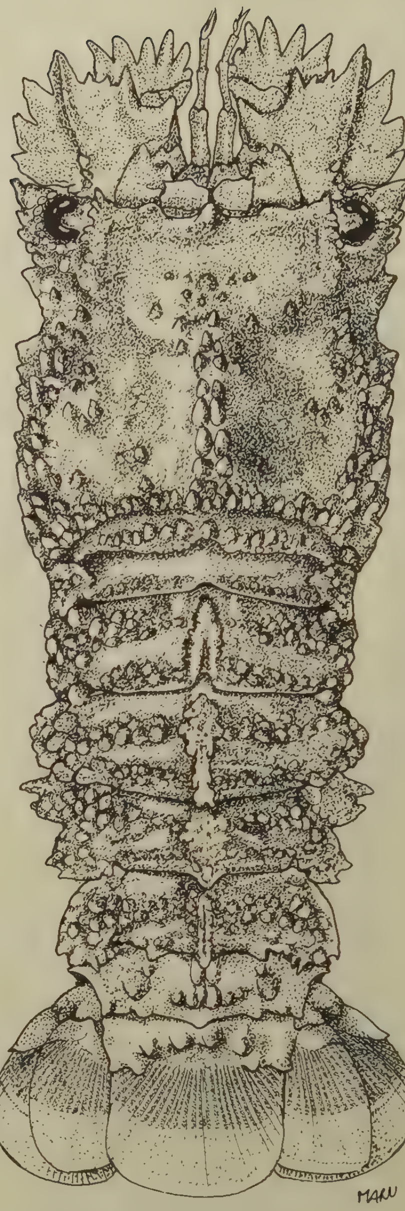
Scyllarus brevicornis Holthuis, 1946, Temminckia, Leiden, 7:92.

Synonyms : ***Arctus rugosus*** Yokoya, 1933 (not ***Scyllarus rugosus*** H. Milne Edwards, 1837).

FAO Names : En - Blue-back locust lobster.

Type : Type locality: "southern Bungo Strait [between Shikoku and Kyushu Islands, Japan], 110 m deep". Holo-type male in Fishery Institute, College of Agriculture, Tokyo University, Tokyo, Japan (dried and in poor condition). As ***S. brevicornis*** is a new name for ***A. rugosus***, the type locality is the same for both.

Diagnostic Features : Carapace with 2 distinct teeth in the median line before the cervical groove (the gastric and rostral teeth), the pregastric tooth is absent. The region between the postrostral and branchial carinae with only a few tubercles and extensive smooth areas. Abdominal somites 2 to 5 with distinct elevated median longitudinal carina; the carina of the third somite is distinctly higher than that of the other somites. The exposed part of the somites without arborescent pattern, but with a wide transverse groove over the middle; behind this groove a transverse ridge extends along the posterior margin of the somite; before the groove there are tubercles and some wide side grooves. Somite 1 dorsally smooth with only an indication of a transverse groove in the extreme lateral part. Posterior margin of somites 5 and 6 not tuberculate. Fourth segment of antenna with the median oblique carina distinct but not quite straight; a row of tubercles is present on the outer half of the upper surface of the segment, tubercles are also present in the basal part of the median carina. The outer margin of the fourth segment has 3 or 4 teeth, the distal largest, the inner margin with 4 or 5 teeth, the basal of which is largest (the apical tooth not included in these counts). The thoracic sternum is widely U-shapedly incised anteriorly; the last 4 sternites show an inconspi-cuous median tubercle. A dorsal fringe of hairs is present on the dactyli of pereiopods 3 to 5. **Colour:** dark brown above, tubercles slightly paler, sometimes with whitish areas in the branchial region and along the central part of the cervical groove. A dark blue spot in the median part of the first abdominal somite (see Chan & Yu, 1986, pl. 5, 9 fig. C,D).



(after Chan & Yu, 1986) Fig. 419

Geographical Distribution : East China Sea (west of the Tokara Islands), Japan (Tosa Bay, Bungo Strait), Taiwan (Fig. 420).

Habitat and Biology : Depth range from 60 to 150 m; substrates: sand or mud.

Size : Total body length 4 to 5.5 cm. Carapace length of 1.3 to 1.8 cm; in ovigerous females 1.6 to 1.8 cm.

Interest to Fisheries : None so far as known. The specimens enter trawls by accident and then are found at fish markets, more likely as trash than as saleable products. Chan & Yu (1986:149) reported the species from local fish markets in Taiwan, these specimens were taken by "baby" shrimp trawlers.

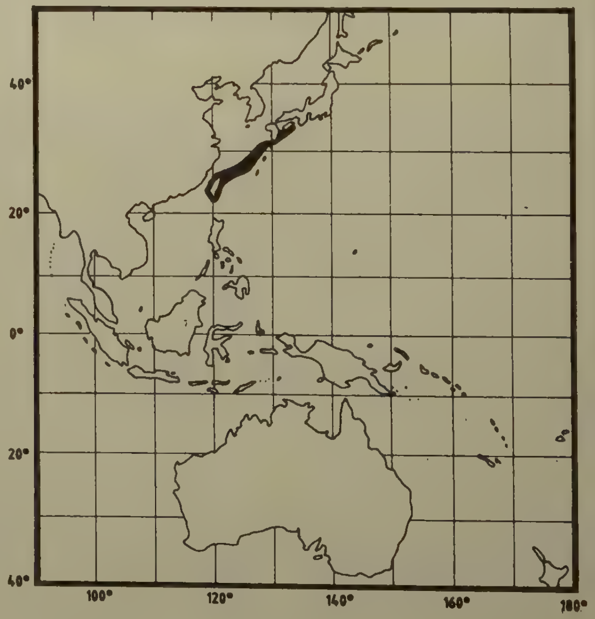


Fig. 420

Literature : Chan & Yu, 1986:156, pl. 5 fig. A-D, pl. 9 fig. C,D.

Scyllarus martensii Pfeffer, 1881

Fig. 421

SCYL Scylr 6

Scyllarus martensii, Pfeffer, 1881, Verhandlungen naturwissenschaftlichen Vereins Hamburg-Altona, (2)5:48.

FAO Names : En - Striated locust lobster.

Type : Type locality: not mentioned in the original description. The two female syntypes are in the collection of ZMH under no. K 7955 and are labelled "Amur Mus.Godeffroy". The locality indication evidently is incorrect as the mouth of the Amur River lies far to the north of the northern limit of the range of ***S. martensii***. The Museum Godeffroy was founded around 1860 as the private collection of Johann Cesar VI Godeffroy, the director of the shipping company J.C. Godeffroy & Sohn in Hamburg. The ships of this company visited East and South Asia, Australia, and the Central and Eastern Pacific. Their captains were asked to collect for the Museum and brought important collections home for that purpose; also private persons were sent out by Godeffroy to collect. When in 1879 the firm Godeffroy collapsed, most of the zoological collections were acquired by the Hamburg Museum. The types of ***S. martensii*** were most likely collected in S.E. Asia, but nothing definite can be said in this respect.

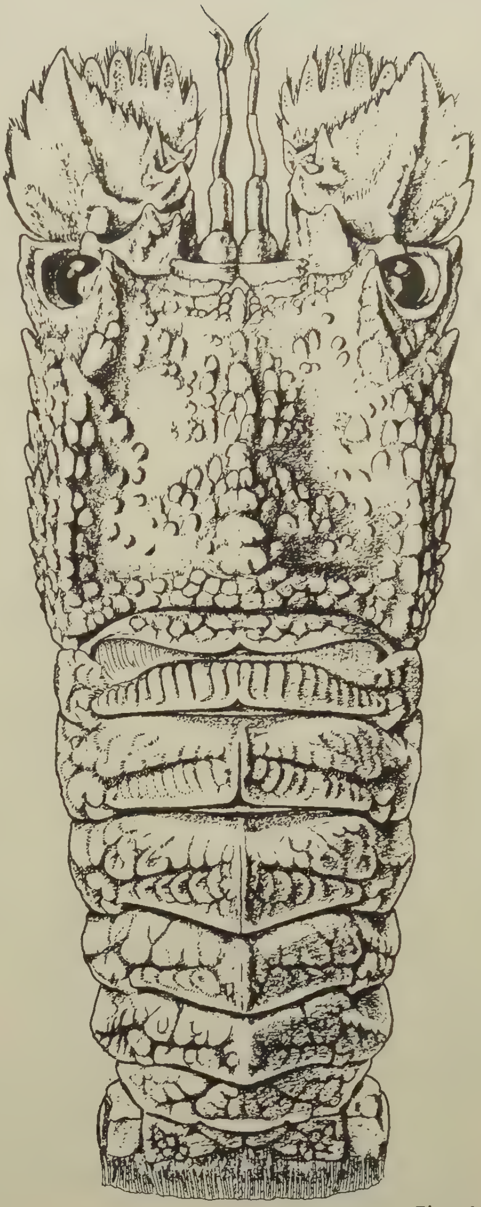


Fig. 421

Diagnostic Features: Carapace with two distinct teeth in the median line before the cervical groove (the gastric and pregastric teeth), the rostral tooth is absent, and replaced by an inconspicuous tubercle. The region between the postrostral and branchial carinae shows many tubercles, especially in the posterior half of the carapace. The abdomen has a conspicuously elevated longitudinal median carina on somites 2 to 5, that of somite 2 shows as an inverted V-shaped ridge when looked at dorsally. The carina of somite 3 is somewhat higher than the others. Somite 1 shows a complete transverse groove behind which there are about 16 straight, parallel longitudinal unbranched grooves, which are quite characteristic for the species. The other somites show a somewhat arborescent pattern on the exposed part. The fourth segment of the antenna has, apart from the distinct and sharp oblique median carina, an additional short curved carina formed by a row of tubercles; this additional carina is on the outer half of the segment. The outer margin of the segment has 3 to 5 (mostly 3) distinct teeth (apical tooth not included), the inner margin has 5 to 9 teeth, the basal of which is largest. The anterior margin of the thoracic sternum is very shallowly concave, narrowly incised in the middle and with a small tubercle either side of that incision. Sternites 2 to 4 show a faint median tubercle each. The pereiopods show no hairy fringes on the dactyli. **Colour:** the body is yellowish or reddish brown, somewhat irregularly marbled. A darker brown transverse band may be present on the third abdominal somite. The legs show a darker band on some of the segments (see Chan & Yu, 1986, pls. 3, 8C ,D).

Geographical Distribution : Indo-West Pacific region from East Africa (Zanzibar, Mozambique) and the western Indian Ocean to Japan, Vietnam, Thailand, Malaysia, Singapore, Taiwan, the Philippines, Indonesia, N.W., N. and N.E. Australia and New Caledonia (Fig. 422).

Habitat and Biology : The species has been found in depths between 6 and 79 m, mostly between 10 and 50 m. The substrate that it inhabits is soft and smooth, consisting of sand and/or mud, sometimes with shells, pumice, foraminiferans or bryozoans.

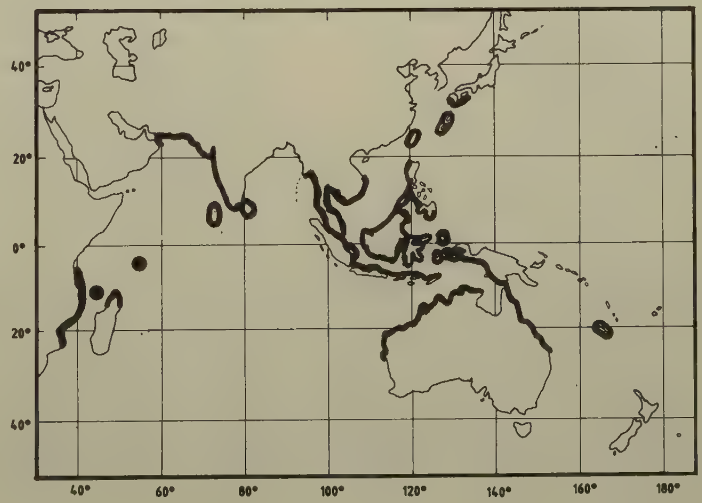


Fig. 422

Size : The total body length in this species is 2 to 4 cm (males), 2 to 6 cm (females), 2.5 to 4 cm (ovigerous females); the respective carapace lengths being 0.4 to 1.3 cm (males), 0.7 to 2 cm (females), 0.5 to 1.5 cm (ovigerous females).

Interest to Fisheries : None. The species is too small to be of any commercial interest and is not found in great quantities. It is sometimes caught accidentally by trawlers fishing for other species; in this way the specimens may reach the fish markets. So far as is known the specimens are not sold per se. Chan & Yu (1986:149) report the species from fish markets in Taiwan being caught there by "baby" shrimp trawlers.

Literature : Chan & Yu, 1986:153, pl. 3 figs A-C, pl. 8 figs C,D.

Scyllarus pygmaeus (Bate, 1888)

Fig. 423

SCYL Scylr 2

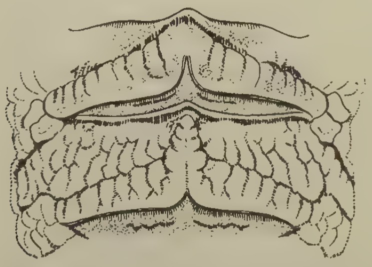
Arctus pygmaeus Bate, 1888, Report Voyage Challenger, Zool., 24:73, pl. 10 fig. 4.

Synonyms: ***Arctus immaturus*** Bate, 1888; ***Scyllarus immaturus*** - Bouvier, 1912.

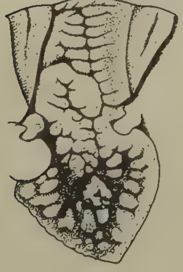
FAO Names : **En** - Pygmy locust lobster; **Fr** - Cigale naine; **Sp** - Cigarra enana.

Type : Type locality of ***Arctus pygmaeus***: "off Gomera, one of the Canary Islands, ... lat. 28°N., long. 16°5'W.; depth 78 fathoms [= 143 m]; bottom, volcanic sand". Ovigerous female holotype in BM.

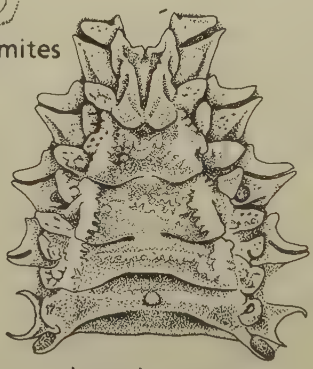
Type locality of ***Arctus immaturus***: "dredged off Cape Verde [Sénégal], but neither station nor depth are recorded". Lectotype in BM.



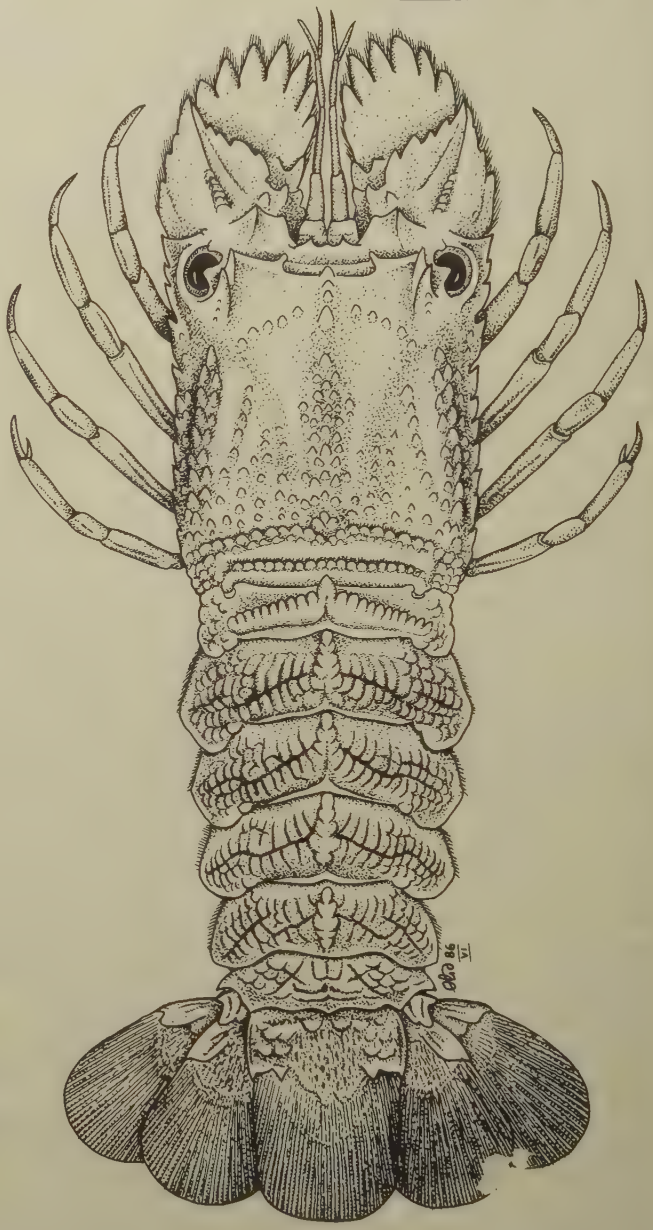
first and second abdominal somites (dorsal view)



second abdominal somite (lateral view)



thoracic sternum (ventral view)



dorsal view

Fig. 423

Diagnostic Features: Carapace with three distinct acute teeth in the median line before the cervical groove (the gastric, pregastric and rostral teeth). Region between the postrostral and branchial carinae with only few tubercles and with extensive smooth areas. Abdomen without a sharp elevated median longitudinal carina, but each of abdominal somites 2 to 5 with an elongate lobulate figure in the middle. The exposed part of abdominal somites 2 to 5 with an arborescent arrangement of very narrow grooves. Somite 1 with a complete transverse groove, behind which there are numerous short longitudinal grooves that may be rather irregular in shape and sometimes are interconnected by transverse grooves; this posterior part of somite 1 is longer in the middle than laterally. The smooth anterior half of abdominal somites 2 to 6 (i.e., the part that disappears under the tergum of the previous somite when the abdomen is fully stretched) on either side with a short transverse groove in which hairs are implanted. Fourth segment of antenna with a single oblique median carina. Outer margin of the segment with 2, the inner margin with 3 or 4 teeth (not including the apical tooth). Thoracic sternum anteriorly U-shapedly incised in the middle. A blunt and low but conical tubercle on the last thoracic sternite. Dactyli of legs without fringes of hair. **Colour:** pale brownish or pinkish with patches of darker hairs. Two dark spots on the dorsal surface of the first abdominal somite in the submedian region.

Geographical Distribution : The entire Mediterranean (but not yet reported from the North African coast east of Morocco), and Atlantic islands (Madeira, Canary Islands, Cape Verde Islands) (Fig. 424).

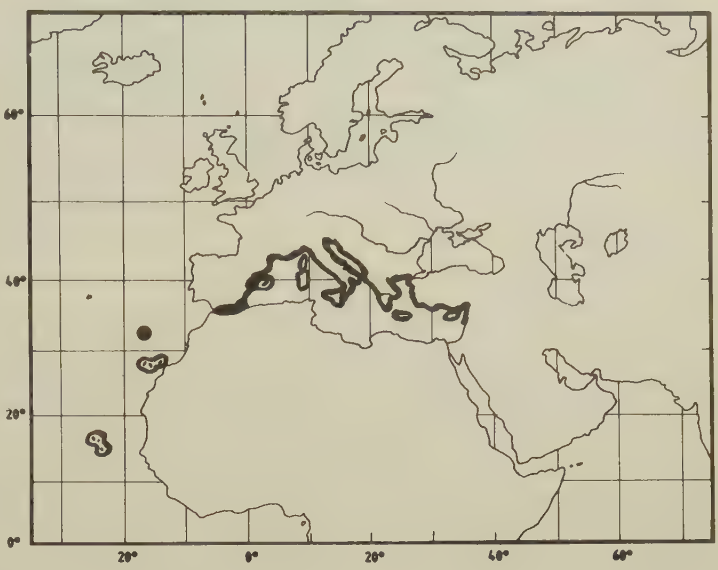


Fig. 424

Habitat and Biology : Depth range from 5 to 100 m. Ovigerous females in June and August.

Size : Maximum total length 5.5 cm, usually not more than 4 cm. Carapace length to 1 cm (males) and 1.15 cm (females).

Interest to Fisheries : Probably nil. The report in Fiches FAO d'Identification, Méditerranée et Mer Noire, vol. 1:319, that the species is fished for in Sardinia with trammel nets and lobster pots and is regularly present at the markets, where it is sold fresh, needs to be considered with much reserve. It is possible that this information is based, not on ***S. pygmaeus***, but on ***S arctus***. The small size of ***S. pygmaeus*** does not make it an attractive fisheries objetc. In N.E. Spain, the fishermen, when they got ***S. pygmaeus*** in their nets, threw it back in the sea, in the conviction that these were juvenile ***Scyllarus arctus***, which needed still some time to grow up to acceptable size.

Literature : Fischer, Bauchot & Schneider (eds), 1987:319.

Scyllarus rugosus H. Milne Edwards, 1837

Fig. 425

SCYL Scylr 7

Scyllarus rugosus H. Milne Edwards, 1837, Histoire naturelle des Crustacés, 2:283.

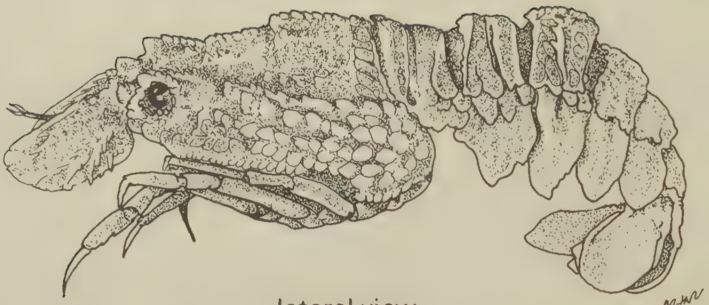
Synonyms: ***Arctus tuberculatus*** Bate, 1888; ***Scyllarus tuberculatus*** - Nobili, 1903.

FAO Names : En - Hunchback locust lobster.

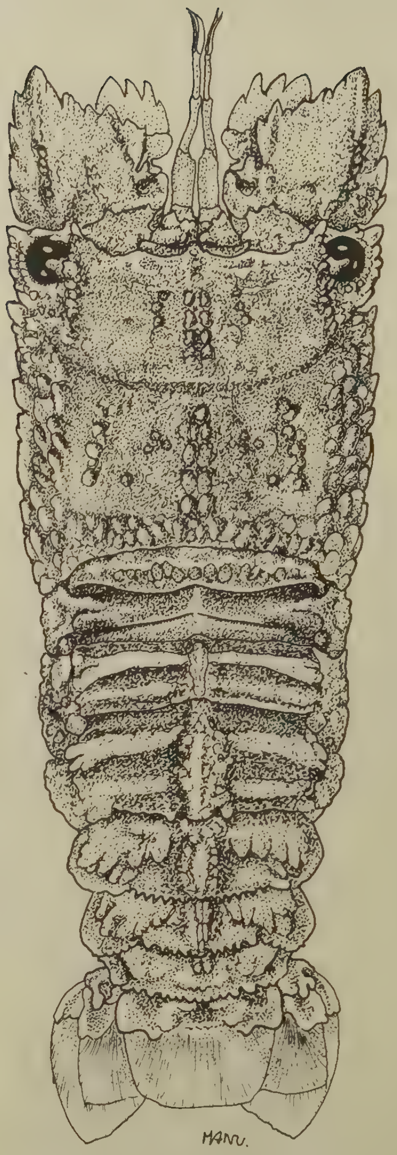
Type : Type locality of ***Scyllarus rugosus***: "Habite la côte de Pondichéry" (= Pondicherry, S.E. India, 11°59'N 79°50'E). Holotype in MP, no longer extant.

Type locality of ***Arctus tuberculatus***: "Challenger" "Station 190, between New Guinea and Australia ... lat. 8°56'S., long. 136°5'E.; depth, 49 fathoms [= 90 m]; bottom, green mud". Syntypes in BM.

Diagnostic Features : The carapace has the median teeth before the cervical groove blunt and inconspicuous: the rostral tooth is reduced to a tubercle, the pregastric tooth is replaced by a double row of 1 or 2 tubercles and a few inconspicuous median tubercles. The gastric tooth is the most conspicuous, it is broad and blunt and bears a double row of tubercles. The surface of the carapace is very uneven and the tubercles are high. Between the postrostral and branchial carinae there are a few tubercles and many smooth areas. The abdomen shows a distinct median longitudinal carina on somites 2 to 5, that of somite 3 is by far the highest, and (like the one of somite 4) bears numerous tubercles laterally. Somite 1 is quite smooth, and has the transverse groove only slightly noticeable in the extreme lateral parts. The exposed part of the following somites shows no arborescent pattern, but in each somite there is a wide transverse groove there. In somite 2, both before and behind this groove there is a perfectly smooth broad ridge, a character in which the species differs from most others. In the following somites these ridges are tuberculate.



lateral view



dorsal view

(after Chan & Yu, 1986)

Fig. 425

In somites 4 to 6 the posterior margin is tuberculate. The fourth antennal segment has a sharp and high oblique median carina. Outside the carina the upper surface of the segment shows a row of tubercles. The outer margin of the segment bears 4 or 5 teeth (apical tooth of the segment not included), the inner margin has 5 to 7 teeth of irregular size. The anterior margin of the thoracic sternum is deeply U-shapedly incised. Each of the thoracic sternites bears a rounded median tubercle. The dactyli of pereiopods 3 to 5 show two short fringes of hair each. **Colour:** the dorsal surface of the body is greyish or purplish brown with darker spots. The distal segment of the antenna is often lighter. The first abdominal somite shows dorsally often a dark blue colour (see Chan & Yu, 1986, pls 1, 8A, 10C).

Geographical Distribution : Indo-West Pacific region from Red Sea, East Africa and Madagascar to Japan, Taiwan, the Philippines, Indonesia and N.E. Australia (Fig. 426).

Habitat and Biology : Inhabits depths from 20 to 60 m, rarely reported from 100 or 200 m. Bottom usually sand and mud, sometimes with coral, shelly grit or rubble.

Size : Total body lengths reported are 2.5 to 6 cm (males), 2.5 to 6 cm (females), 3 to 6 cm (ovigerous females) and carapace lengths of 0.8 to 2.1 cm (males), 0.8 to 2.2 cm (females), 1 to 2.2 cm (ovigerous females).

Interest to Fisheries : Like the other Indo-West Pacific species of the genus, ***S. rugosus*** is hardly of any commercial importance, if at all. It is taken accidentally by trawlers fishing for other species and so get to the fish markets. Chan & Yu (1986:149) reported it from fish markets in Taiwan, brought in by "baby" shrimp trawlers, but Chang (1965) does not list any ***Scyllarus*** among the "Edible Crustacea of Taiwan".

Literature : Chan & Yu, 1986:150-152, pl. 1 figs A-E, pl. 8 fig. A, pl. 9 fig. C.

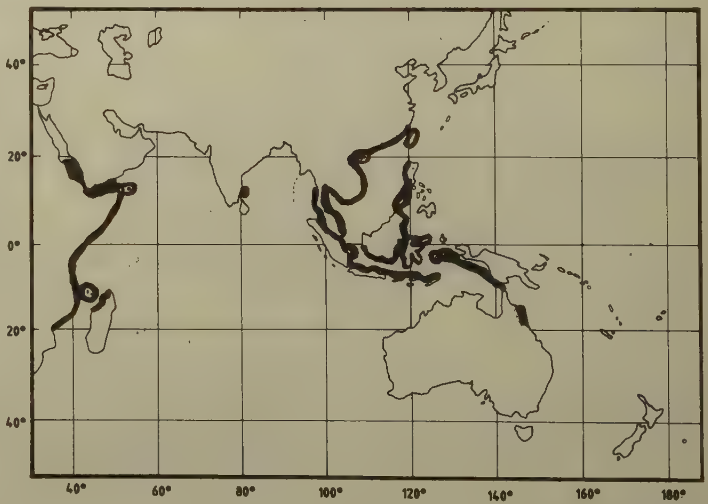


Fig. 426

SUBFAMILY **THENINAE** Holthuis, 1985

Theninae Holthuis, 1985, Zoologische Verhandelingen, Leiden, 218:10,12

The subfamily is monotypic, the genus ***Thenus*** Leach, 1815, is its type and only genus.

Thenus Leach, 1815

SCYL Then

Thenus Leach, 1815, Transactions of the Linnean Society, London, 11:335, 338. Gender masculine. Name placed on the Official List of Generic Names in Zoology by the International Commission on Zoological Nomenclature in Opinion 519 (published in 1958).

Type Species: by monotypy: ***Thenus indicus*** Leach, 1815 (= junior subjective synonym of ***Scyllarus orientalis*** Lund, 1793).

Synonyms: ***Sagaritis*** Billberg, 1820, Enumeratio Insectorum in Museo Gust.Joh.Billberg:134. Type species by monotypy ***Scyllarus orientalis*** Lund, 1793. Gender feminine.

Scyllibacus Desjardins, 1831, Proceedings of the Committee of Science and Correspondence of the Zoological Society of London, 1(4):46. Type species by monotypy: ***Scyllibacus orientalis*** Desjardins, 1831. Gender masculine. If ***Scyllibacus orientalis*** Desjardins is a new combination of ***Scyllarus orientalis*** Lund, 1793, ***Scyllibacus*** falls as a junior objective synonym of ***Thenus*** Leach, 1815; if it is a new species, ***Scyllibacus*** is a nomen nudum.

At present only a single species is recognized within the genus ***Thenus***, but recent studies, indicate the possibility that more than one species may have been confused under the name ***Thenus orientalis***.

Thenus orientalis (Lund, 1793)

Fig. 427

SCYL Then 1

Scyllarus orientalis Lund, 1793, K.Danske Videnskabers Selskab Skrifter, (n.ser.)2(2):22. Name placed on the Official List of Specific Names in Zoology, in Opinion 519 (published in 1958).

Synonyms: ***Thenus indicus*** Leach, 1815; ***Sagaritis orientalis*** - Billberg, 1820; ***Scyllibacus orientalis*** - Desjardins, 1831.

FAO Names : En - Flathead lobster; **Fr** - Cigale raquette; **Sp** - Cigarra chata.

Type : Type locality of ***S. orientalis***: "Fra Ostindien og China". Lund's material consisted of a specimen from Tranquebar, India, and one from China, so that both are syntypes; also a syntype is the specimen figured on pl. 2 fig. D in Rumphius' (1705) Amboinsche Rariteitkamer, this specimen not necessarily comes from Amboina, as the figure was made in Holland after a specimen of unknown locality and subsequently added to Rumphius' manuscript, it most likely originated from Indonesia. One of Lund's two specimens is in UZM, it is preserved in alcohol, its condition is reasonable; the second specimen is lost. The third syntype specimen formed part of the collection of Henricus d'Acquet, burgomaster of Delft, The Netherlands, this collection was sold publicly in 1708, the fate of the specimen of ***Thenus*** is unknown.

Type locality of ***Thenus indicus***: "Habitat in mari Indico". Holotype in BM, no. 107 a 54, dry, condition fair (it is not fully certain that this is the holotype).

Geographical Distribution : Indo-West Pacific region: from the east coast of Africa (southern Red Sea to Natal) to China, southern Japan, the Philippines and tropical Australia (Western Australia to Queensland) (Fig. 428).

Habitat and Biology : Depth range from 8 to 70 m (exceptionally in 100 m), usually between 10 and 50 m; on soft substrate: sand or mud, or a mixture of the two, sometimes with shells or gravel.

Size : Maximum total body length about 25 cm; maximum carapace length about 8 cm.

Interest to Fisheries : The species often appears as a by-catch in the nets of trawlers and is edible. It is also reportedly taken by divers although there is no specialized fishery for it. Specimens caught in the sixties in the southern Red Sea by Israeli trawlers were frozen and sold in Israel. Experimental fishing undertaken in 1975 to 1976 off the coast of East Africa (Kenya to Mozambique) and elsewhere in the Western Indian Ocean was not promising for this species (up to 30 specimens per hour). Longhurst (1970:286) mentioned that it is "caught in the Gulf of Thailand, and on a small scale off Malaysia and Singapore". In Queensland, the shrimp fishery lands ***Thenus*** as a bycatch where it ranks above ***Ibacus*** as a food item (Grant, 1978:685). It is also offered for sale in Sydney markets. In Taiwan, this species is found in markets year-round but is most abundant from March to August, and is marketed together with ***Ibacus ciliatus*** and ***I. novemdentatus*** (Chang, 1965:47). In the Philippines it is priced lower than spiny lobsters (Motoh & Kuronuma, 1980:58). Davidson (1977:141) remarked of this species: "The meat of the slipper lobster is not quite up to the standard of good prawns or spiny lobsters, but is nonetheless well worth eating". Marketed locally either fresh or frozen.

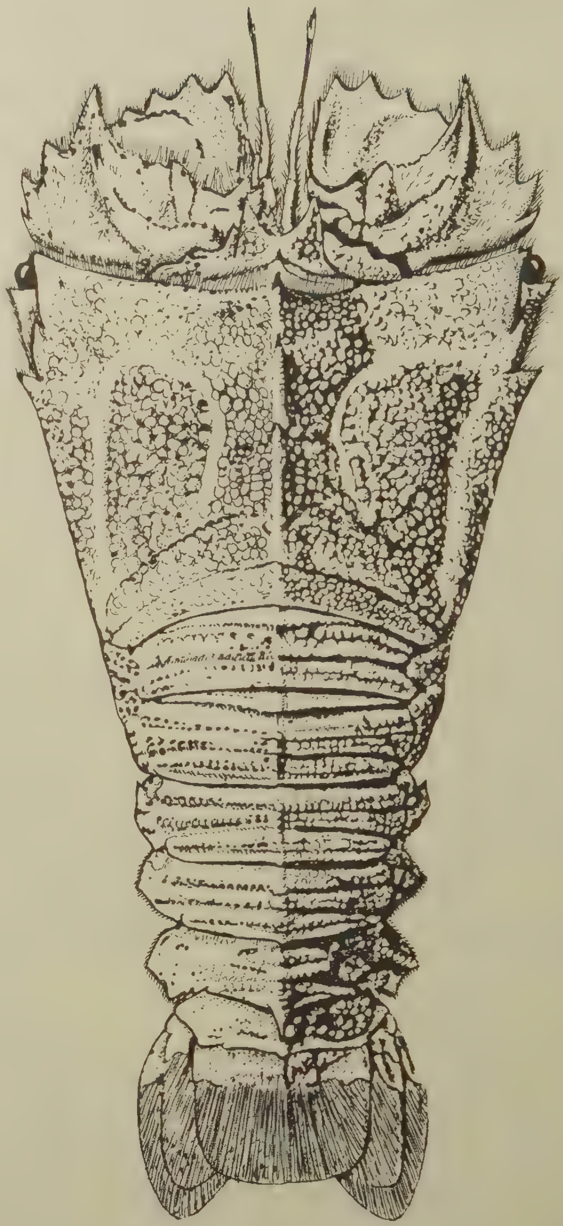


Fig. 427

Local Names : AUSTRALIA: Bay lobster (official name), Moreton Bay bug, Bug, Gulf lobster, Northern bay lobster, Shovelnosed lobster; BURMA: Kyauk-pa-zun; HONG KONG: Pei pa ha; INDONESIA: Udang pasir; JAPAN: Uchiwa-ebi-modoki; KAMPUCHEA: Bangkang pak; MALAYSIA: Udang lobok; MAURITIUS: Homard sans cornes; MOZAMBIQUE: Cava-cava triangular; PAKISTAN: Kikat (Sindhi), Kikka (Baluchistan); PHILIPPINES: Pitik-pitik, Bay lobster, Cupapa, Sand crayfish, Sand lobster, Shovelnosed lobster, Slipper lobster; SINGAPORE: Common flapjack lobster; TANZANIA: Kamba; THAILAND: Kung kradan, Kung hin.

Literature : Fischer & Bianchi (eds), 1984:vol. 5; Williams, 1986:26, figs 61(fig. 61 and 62 have been interchanged), 80 g.

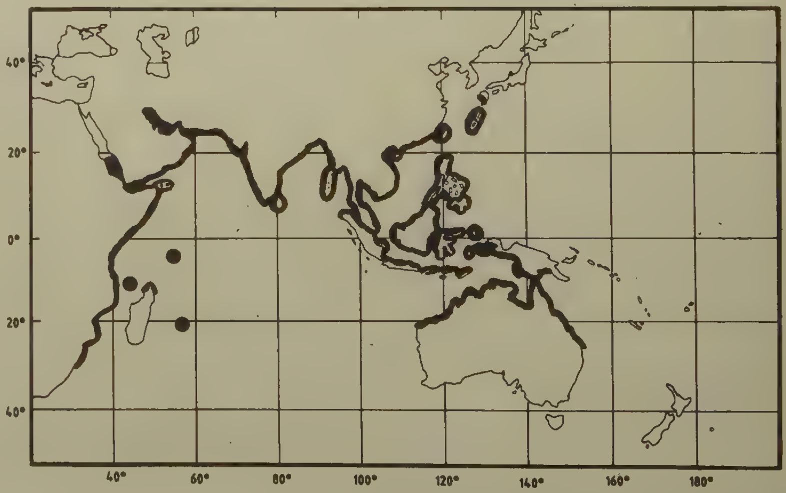


Fig. 428

2.3 INFRAORDER **THALASSINIDEA** Latreille, 1831

Thalassinides Latreille, 1831, Cours d'Entomologie:377.

The infraorder contains a single superfamily Thalassinoidea Latreille, 1831, with 7 families, viz., Axianassidae, Axiidae, Callianassidae, Callianideidae, Laomediidae, Thalassinidae and Upogebiidae with all together more than 350 known species. Of these 7 families only 3 are dealt with here as the other do not have species of which it is known that they are of interest to fisheries. Of these three families, Thalassinidae, Callianassidae and Upogebiidae, perhaps two or three species are used for human consumption, a number of others is used as bait for fishing.

2.3.1 **FAMILY THALASSINIDAE** Latreille, 1831

THAL

Thalassinides Latreille, 1831, Cours d'Entomologie:377. Name placed on the Official List of Family Names in Zoology, in Opinion 434 (published in 1956).

Synonyms: Scorpionoidae Haworth, 1825, Philosophical Magazine, London, 65:184 (not based on an included genus and thus unavailable).

The family consists of a single genus.

Thalassina Latreille, 1806

THAL Thal

Thalassina Latreille, 1806, Genera Crustaceorum et Insectorum, 1:51. Gender feminine. Name placed on the Official List of Generic Names in Zoology by the International Commission on Zoological Nomenclature in their Opinion 434 (published in 1956).

Type species: by monotypy: ***Thalassina scorpionides*** Latreille, 1806 (= junior subjective synonym of ***Cancer (Astacus) anomalus*** Herbst, 1804).

Until recently this genus was generally considered to have a single species, but recent investigations make it likely that more than one have to be recognized. A revision of the taxonomy of ***Thalassina*** is badly needed.

Thalassina anomala (Herbst, 1804)

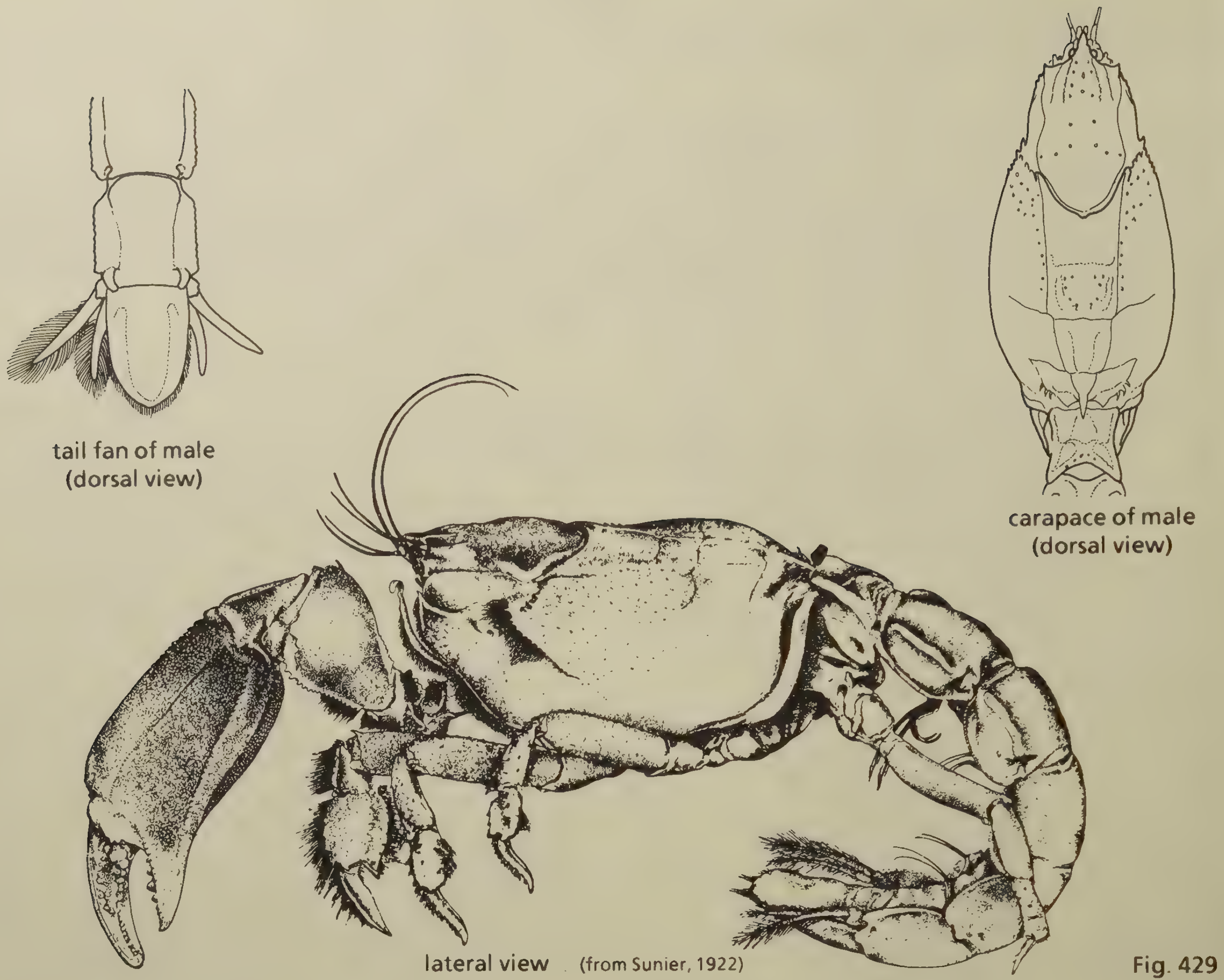
Fig. 429

THAL Thal 1

Cancer (Astacus) anomalus Herbst, 1804, Versuch einer Naturgeschichte der Krabben und Krebse, 3(4):45, pl. 62. Name placed on the Official List of Specific Names in Zoology, in Opinion 434 (published in 1956).

Synonyms: ***Thalassina scorpionides*** Latreille, 1806; ***Thalassina scabra*** Leach, 1814; ***Thalassina talpa*** White, 1847 (nom. nud.); ? ***Thalassina gracilis*** Dana, 1852; ***Thalassina chilensis*** Steenstrup & Lütken, 1862; ***Thalassina maxima*** Hess, 1865.

FAO Names : En - Scorpion mud lobster.



tail fan of male (dorsal view)

carapace of male (dorsal view)

lateral view (from Sunier, 1922)

Fig. 429

Type : Type locality of ***Cancer anomalus***: "Das Vaterland dieses Krebses ist völlig unbekannt"; holotype in ZMB, no. 1256, dry, condition reasonable.

Type locality of ***Thalassina scorpionides*** not indicated in the original description, evidently likewise unknown; type material in MP, now absent.

Type locality of ***T. scabra*** not mentioned either, probably unknown; type material "in the Hunterian Museum", present whereabouts unknown.

Type locality of ***T. talpa***: "Philippine Islands"; holotype in BM, no. 43.6 (in alcohol, condition poor).

Type locality of ***T. gracilis***: "from shores of Telegraph Island, near Singapore"; holotype in USNM.

Type locality of ***T. chilensis***: "Mare Chilense"; holotype in MP, no Th 537, in alcohol, condition mediocre. As pointed out by Holthuis (1952:85-86) the locality label probably is incorrect, as the species since has never been found in Chile.

Type locality of ***T. maxima***: "Sydney", New South Wales, Australia; holotype in SMF, no. ZMG 227, in alcohol, broken, but condition otherwise fair. This locality indication likewise is highly dubious as the species does not occur near Sydney.

Diagnostic Features : The integument of the body is very firm. The carapace is high; in dorsal view it is elongate oval in outline. In adults the carapace measures less than 1/3 of the total body length. The rostrum is narrowly triangular and short; it is depressed and its lateral margins continue for some distance on the carapace as short divergent ridges. The rostrum has no teeth. The carapace ends posteriorly in a distinct posteriorly directed median tooth that overhangs the articulation with the first abdominal somite. The abdomen is long and narrow, more than 5 times as long as wide in the males, about 4 times as long as wide in the females. The somites are of about equal width throughout their length, they have a longitudinal carina over the base of the pleura. The telson is about as long as the previous somite, but slightly narrower, the posterior margin is broadly rounded. The uropods are styliform. The eye are small. The first pair of pereiopods is very strong and asymmetrical, both chelae are subchelate, the larger less conspicuously so than the smaller. The second legs are smaller, also subchelate; the other legs are simple. Epipods are present on the pereiopods. **Colour:** the whole body is rather uniformly yellowish or reddish brown.

Geographical Distribution : Indo-West Pacific region, from the west coast of India to S. Japan (Ryukyu Islands), Vietnam, the Philippines, Indonesia, New Guinea, New Britain Island, N. and N.E. Australia, Fiji, Samoa (Fig. 430).

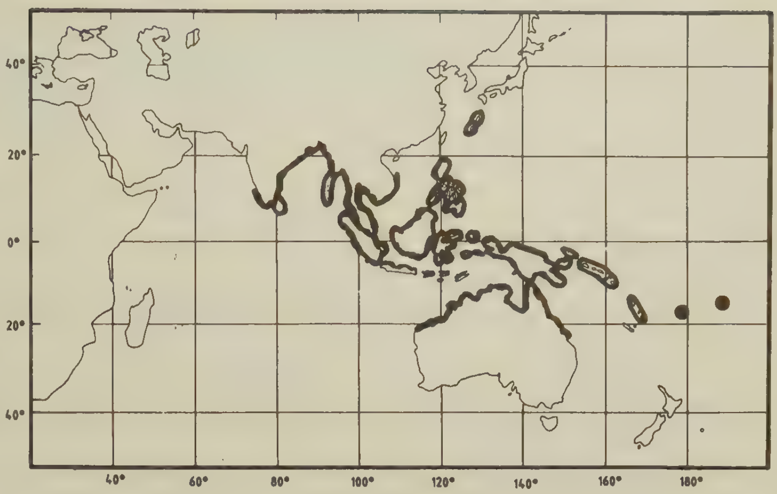


Fig. 430

Habitat and Biology : The species lives in the littoral and supralittoral zones, where it digs its burrows. These can be found in mangrove areas and estuaries. The excavated mud forms a kind of chimney or mound over the openings of the burrows, and because of their height form a most conspicuous feature in the landscape. The chimneys can be 75 cm high, but sometimes several chimneys together can form complex hills of mud up to 1.5 m high. The burrows go down vertically or obliquely to the water level after which they may make zigzags and side branches; the depths of the burrows has been estimated to be up to 2.5 m. The animals are rarely seen out of their burrows, not even at night, but it seems that after heavy rainfall they may venture outside. They are sluggish and are definitely mud feeders, reports that they also are vegetarian have been doubted. Their burrowing activities take usually place during the night.

Size : Usually up to 16 to 20 cm in total body length, although there are records of up to 30 cm.

Interest to Fisheries : Minor. Already Rumphius (1705:6), when dealing with this species from Amboina, Moluccas, Indonesia, remarked on its poor culinary qualities: "Hy heeft weinig ja schier geen vleesch, want het geheele lyf en de staert steeken vol groenachtige modder, en slechts in de scheeren vindmen een weinig wit brokkelig vleesch, van geenen byzonderen smaak.... De Inlanders van Celebes eeten het vleesch van de scheeren, 't welk ik hun willende nadoen, hebbe my niet wel daar op bevonden; dies ik hem voor eenen onnutten Kreeft houde, of hy most in andere Landen beter zyn" (It has little, or almost no meat, as the entire body and the tail are full of a greenish mud, and only in the pincers there is a small amount of white, crumbly meat, without a particular taste. The natives of Celebes eat the meat of the pincers, but when I myself tried this, the meat did not agree with me, therefore I consider this a useless lobster, unless it is of a better quality in other countries). Motoh & Kuronuma (1980:64) remarked that there is no special fishery for this species in the Philippines and that it is only occasionally picked up by fish pond workers. It appears only rarely on the Philippine fish markets. Ward (1943, Army, 2(4):30, fig.) in his paper "New Guinea menu" listed ***Thalassina anomala*** among the edible crustaceans. Tan & Ng (1988:85), remarked that in Singapore the animals are considered edible, but are "not popular locally". On a wall chart, issued recently by the Fisheries Division of the Ministry of Primary Industries of Fiji, the present species figures among the "aquatic foods of Fiji". In Thailand, as I was informed by Prof. Phaibul Naiyanetr of Chulalongkorn University, Bangkok, the species is not eaten but used as medicine against asthma; it is then either dried, ground to powder, and the powder drank with water, or the specimen is placed in a kind of alcoholic liquor and left there for a couple of days, after which the liquor with the beneficial substances dissolved in it is drunk.

The positive qualities of the species from the point of human interest thus are rather small, and its negative qualities seem to be more important. In many areas the species is considered a pest. "The animal is notorious for causing severe damage to bunds [of prawn ponds] by its burrowing activities. The paddy fields and backyards of houses in the proximity of the creeks are also subject to this sort of damage" (Sankolli, 1963:604). Also earth roads can suffer from the burrowing of the species. Dammerman (1929:120) reported that "the species has been noticed as destructive to nipa seedlings, which may be protected by surrounding them with small bamboo fences", but the correctness of this observation has later been doubted by Kalshoven & Van der Vecht (1950:63); the fact that Thalassina is not a vegetarian but mainly a mud feeder supports the view of the latter authors. All in all it seems that Rumphius indeeed was right in considering this as a "useless lobster" from an economic viewpoint.

Local Names : AUSTRALIA: Mud lobster; FIJI: Maná, Tola. INDONESIA: Udang katak, Udang tanah; Udang petsje (Amboina); JAPAN: Okinawa-ana-jyako; MALAYSIA: Udang ketak; PHILIPPINES: Kolokoy, Kulokoy, Palatak (Tagalog language), Oson, Uson (Ilongo language); Manla (Cebu language); THAILAND: Mae hop.

2.3.2 FAMILY UPOGEBIIDAE Borradaile, 1903

UPOG

Upogebiinae Borradaile, 1903, Annals Magazine Natural History, (7)12:542. Name placed on the Official List of Family Names in Zoology, in Opinion 434 (published in 1956). Type genus **Upogebia** Leach, 1814.

Synonyms: Gebiadae Haworth, 1825, Philosophical Magazine, London, 65:184. Type genus **Gebia** Leach, 1815.

The taxonomy of this family is still in a state of uncertainty. Until recently only a single genus, **Upogebia**, was recognized in it, being divided into several subgenera. In 1982, Sakai added two more Upogebiid genera, while some recent authors have elevated some of the subgenera to full generic status (an action not recognized here).

Of the many (about 100) species of Upogebiidae known at present, this catalogue deals only with the five species that have been reported to be of fisheries interest. All five of these species belong in the nominotypical subgenus **Upogebia**.

As the number of species treated here is so small compared to the total number of Upogebiids, no effort has been made to provide a key, but of each species the most important morphological features are presented.

Upogebia Leach, 1814

UPOG Upog

Upogebia Leach, 1814, Brewster's Edinburgh Encyclopaedia, 7:400. Gender feminine. Name placed on the Official List of Generic Names in Zoology by the International Commission on Zoological Nomenclature in their Opinion 434 (published in 1956).

Type Species: by monotypy: ***Cancer (Astacus) stellatus*** Montagu, 1808.

Synonyms: ***Gerbios*** Bosc, 1813, Bulletin Société philomatique, Paris, 3(66):233. Type species, selected by Holthuis, 1954, Bulletin zoological Nomenclature, 9(11):335: ***Thalassina littoralis*** Risso, 1816 (= junior subjective synonym of ***Astacus pusillus*** Petagna, 1792). Gender feminine. Name suppressed under the plenary power of the International Commission on Zoological Nomenclature and placed on the Official Index of Rejected and Invalid Generic Names in Zoology in their Opinion 434 (published in 1956).

Gebia Leach, 1815, Transactions Linnean Society, London, 11:335, 342. Type species, selected by Lucas, 1835, Dictionnaire pittoresque d'Histoire naturelle, 3:353: ***Cancer (Astacus) stellatus*** Montagu, 1808. Gender feminine.

Bigea Nardo, 1847, Sinonimia moderna delle specie registrata nell'opera intitolata: Descrizione de' Crostacei, de' Testacei e de' Pesci che abitano le lagune e Golfo Veneto ... dall'Abate Stefano Chiereghini: 8. Type species, by monotypy: ***Bigea tipica*** Nardo, 1847. Gender feminine.

Calliadne Strahl, 1862, Monatsberichte Königlichen Akademie Wissenschaften Berlin, 1861:1064. Type species, by monotypy: ***Calliadne savignii*** Strahl, 1862. Gender feminine.

Gebiopsis A. Milne Edwards, 1868, Nouvelles Archives Muséum Histoire naturelle, Paris, 4:63. Type species, by monotypy: ***Gebiopsis nitidus*** A. Milne Edwards, 1868. Gender feminine.

Gebicula Alcock, 1901, A Descriptive Catalogue of the Indian Deep-Sea Crustacea Decapoda Macrura and Anomala in the Indian Museum: 201. Type species by monotypy: ***Gebicula exigua*** Alcock, 1901. Gender feminine.

Neogebicula K. Sakai, 1982, Researches on Crustacea, Tokyo, spec. no. 1:8,72. Type species, by original designation: ***Upogebia (Neogebicula) alaini*** K. Sakai, 1982. Gender feminine.

Acutigebia K. Sakai, 1982, Researches on Crustacea, Tokyo, spec.no. 1:8, 69. Type species, by original designation: ***Gebia danai*** Miers, 1876. Gender feminine.

The species of this genus are burrowers in mud or sandy mud. All the species treated here are used as bait for fishing. Only one of them, ***U. pusilla*** is said to be used for human consumption. For most ***Upogebia*** species, very little or no information on use as food or bait is available. Therefore, it is well possible that many more species than those included in the catalogue are actually consumed and most likely all species inhabiting accessible places in sufficiently great numbers qualify for use as bait.

Remarks: The species of ***Upogebia*** can easily be distinguished from those of ***Callianassa*** enumerated here, by the following features: the shape of the carapace, which in the present genus ends in a broad, flat rostrum, sometimes tridentate anteriorly and reaching beyond the eyes; the dorsal surface of the rostrum, which continues onto the anterior part of the carapace, is elongate, flat and wide, and densely packed with tubercles and tufts of short hair. In ***Callianassa***, the carapace is smooth and naked and ends in a short conical or 3- to 5-pronged rostrum. The pereiopods of the first pair are equal in ***Upogebia***, unequal in ***Callianassa***.

The five species of ***Upogebia*** enumerated here all belong to the nominotypical subgenus ***Upogebia***, which is characterized by the presence of one or more spine(s) on the anterolateral margin of the carapace, just behind the eye, and by the pereiopods of the first pair that are subchelate. There are no epipods on the pereiopods.

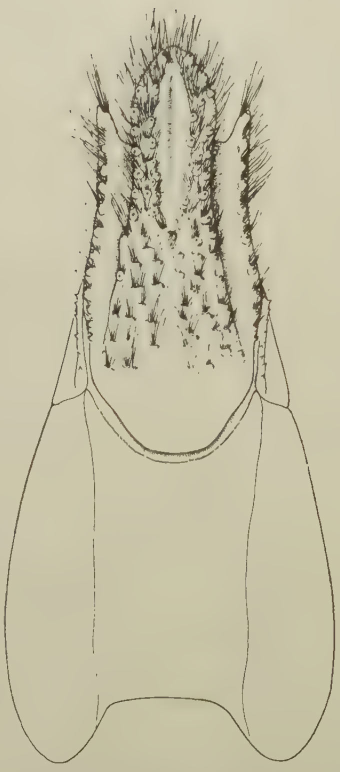
Upogebia capensis (Krauss, 1843)

Fig. 431

UPOG Upog 1

Gebia major capensis Krauss, 1843, Die Südafrikanischen Crustaceen:54.

Synonyms: ***Gebia africana*** Ortmann, 1894; ***Upogebia africana*** - Barnard, 1947. Until 1947 usually only a single species of the subgenus ***Upogebia*** was recognized in South African waters, the names ***Gebia major capensis*** Krauss, 1843, ***Gebia subspinosa*** Stimpson, 1860, and ***Gebia africana*** Ortmann, 1894, were considered synonyms. Barnard (1947:380-381; 1950:519) then showed that two species are involved and used for them the names ***Upogebia africana*** (Ortmann, 1894) and ***U.capensis*** (Krauss, 1843), considering ***U. subspinosa*** (Stimpson, 1860) a synonym of ***U. capensis***. The original description of ***Gebia major capensis*** is short and to modern standards very incomplete and does not unequivocally point to be based on one or the other of the South African species; there are arguments for the identity of the type material with both ***U. subspinosa*** and ***U. africana***, while furthermore the type material is no longer extant. K Sakai (1982:43-46) definitely decided the problem by selecting a neotype for Krauss' species. Unfortunately Sakai chose as the neotype a specimen of ***U. africana***, upsetting thereby the nomenclature for the two species that was rather consistently used since Barnard in 1947 recognized their distinctness. Sakai's action switched the name ***capensis*** from one species to the other. As Sakai's decision is perfectly legal, his nomenclature has to be followed. It is good to realize, however, that in most papers since 1948 the present species is indicated as ***U. africana*** (Ortmann) and that the name ***U. capensis*** during that period was mostly used for ***U. subspinosa*** (Stimpson).



carapace (dorsal view)

(from Sakai, 1982) Fig. 431

FAO Names : **En** - Cape mud shrimp.

Type : Type locality of ***Gebia major capensis***: "Tafelbai" (= Table Bay, Cape Province, South Africa). Type material in Staatliches Museum für Naturkunde, Stuttgart, Germany, now lost; neotype locality: "Knysna, South Africa"; neotype male in ZMH, no. 29852.

Type locality of ***Gebia africana*** : "Port Elisabeth" (= Port Elizabeth, Cape Province, South Africa). Holotype in MZS, preserved dry, condition very poor.

Diagnostic Features: Rostrum ending in three teeth; the lateral teeth are placed at the end of a ridge that is separated from the central part of the dorsal surface of the rostrum by a deep groove. On the central part itself a very shallow median groove is present. There are no ventral teeth on the rostrum. The anterolateral border of the carapace with a single spine behind the eye First pereiopods subchelate. Dactylus of adult male with a longitudinal groove on either lateral surface, and without a tooth on the cutting edge. Palm with 2 dorsal denticulate carinae. Merus without an anterodorsal spine. Coxae of first three pereiopods without spines.

Geographical Distribution : Southern Africa from Olifants River estuary (Atlantic coast of Cape Province, South Africa) to Delagoa Bay (= Bay of Lourenço Marques, Mozambique) (Fig. 432).

Habitat and Biology : "Burrows in the sandy mud of estuaries from mid-tide to LWS [= Low water spring tide]. A detritus feeder" (Day, 1969:108).

Size : Total body length 1.5 to 1.6 cm, ovigerous females 2.7 to 6.5 cm.

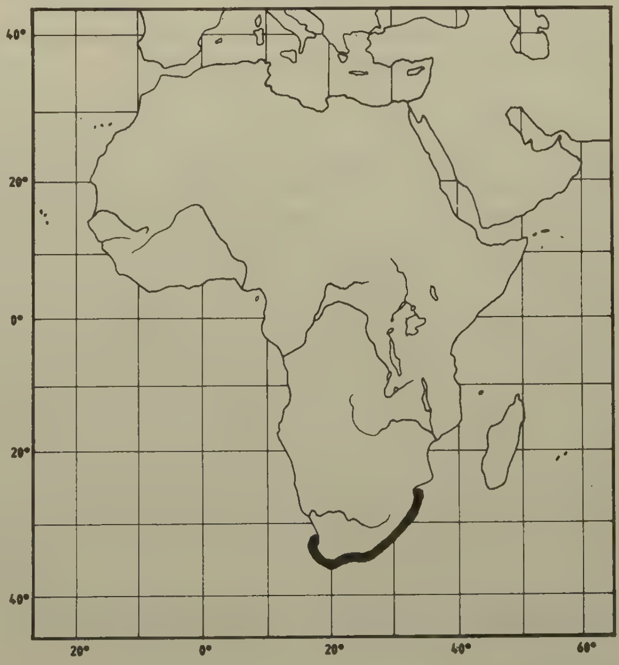


Fig. 432

Interest to Fisheries : In South Africa the species is "used extensively as bait" (Day, 1969:108), but there are restrictions to its collecting, as according to the law each person may collect "not more than fifty per day and the prawns may not be disturbed or removed by means of a shovel, fork or spade" (Tietz & Robinson, 1974:88).

Local Names : SOUTH AFRICA: Moddergarnaal, Mud prawn.

Literature : Barnard, 1950:519. Sakai, 1982:43, text-fig. 9c, pl. A fig. 6, pl. D figs 5,6.

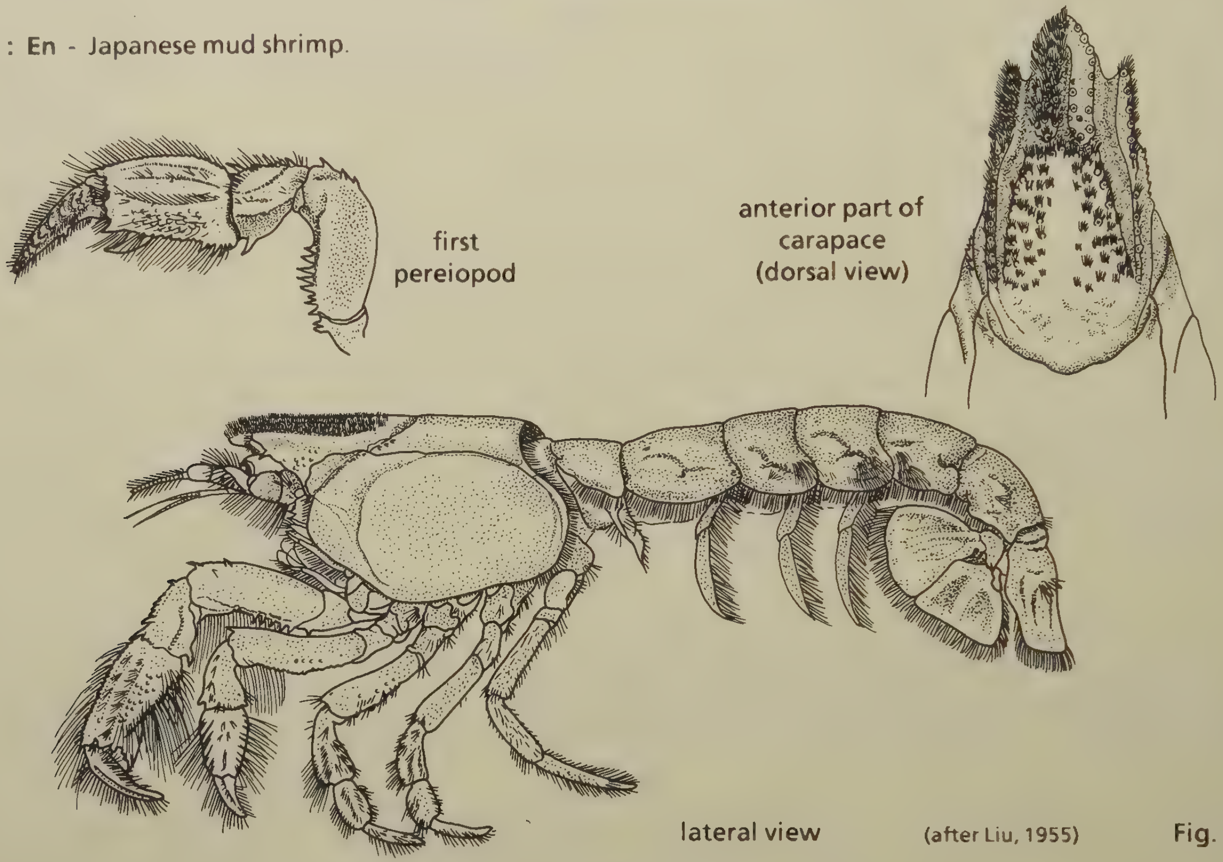
Upogebia major (De Haan, 1841)

Fig. 433

UPOG Upog 2

Gebia major De Haan, 1841, in P.F. von Siebold, Fauna Japonica, Crustacea, (5):pl.35 fig. 7. The description, p. 165, appeared in part 6, published in 1849.

FAO Names : En - Japanese mud shrimp.


first pereiopod
anterior part of carapace (dorsal view)
lateral view

(after Liu, 1955) Fig. 433

Type : Type locality: "Japonia", probably near Nagasaki, Kyushu, Japan. Type material in RMNH, now lost.

Diagnostic Features: Rostrum ending in 3 teeth, the lateral at the end of a ridge that is separated from the central part of the rostrum by a deep groove; a shallow median longitudinal groove is present in the central part. The lower surface of the rostrum has no spines. Anterolateral border of carapace with a single spine at the level of the eye. First pereiopods subchelate. Dactylus of adult male with 9 to 11 oblique ridges on the outer surface, and with a low tooth in the proximal half of the cutting edge. Two denticulate ridges on the upper surface of the palm. Merus of first pereiopod with a distinct subdistal anterodorsal spine; coxa of that leg with a spine.

Geographical Distribution : Northwest Pacific region: S.E. coast of Siberia, USSR, from Olga Bay (about 44°N) southward, Korea, N. China, Kuril Islands, Japan (Fig. 434).

Habitat and Biology : In tidal mud flats. The animals make Y-shaped burrows in the mud and are filter feeders.

Size : Maximum total body length 9.5 cm.

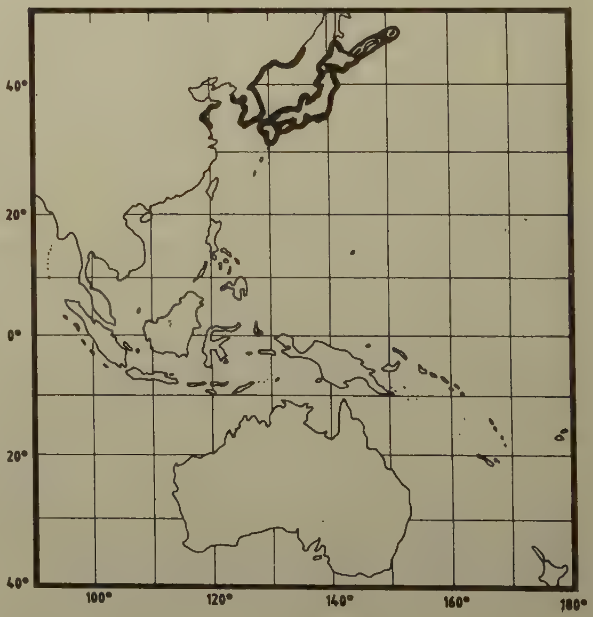


Fig. 434

Interest to Fisheries : Probably used as bait for fishing. Listed by Liu (1955:66, pl. 24 figs 1-6) among the "Economic Shrimps and Prawns of North China". Parisi (1917:23) mentioned 3 specimens obtained at the market of Yokohama, Japan.

Local Names : JAPAN: Ana-jyako.

Upogebia pugettensis (Dana, 1852)

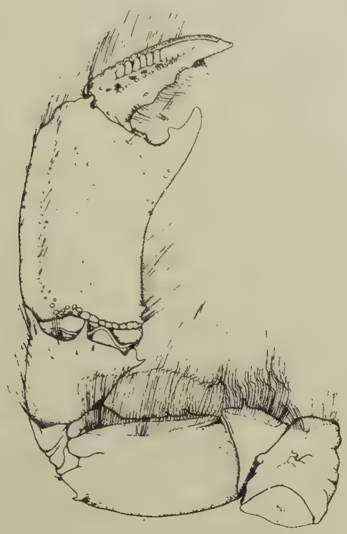
Fig. 435

UPOG Upog 3

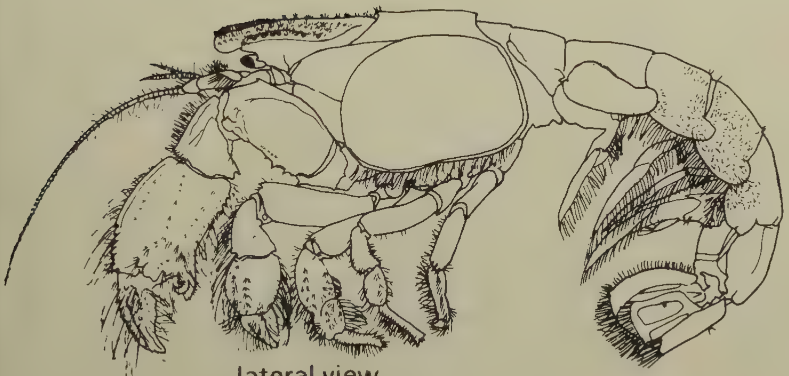
Gebia pugettensis Dana, 1852, Proceedings Academy Natural Sciences, Philadelphia, 6:19.

Synonyms: ***Gebia californica*** Stimpson, 1856.

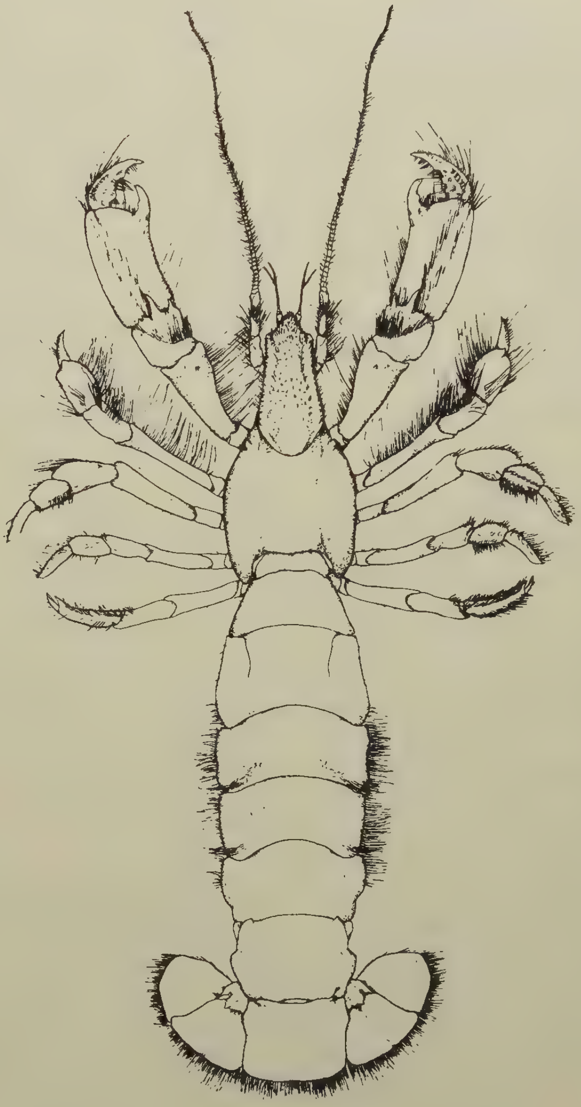
FAO Names : **En** - Blue mud shrimp.



first pereiopod
(from Stevens, 1928)



lateral view
(from Hart 1982)



dorsal view
(from Stevens, 1928)

Fig. 435

Type : Type locality of ***Gebia pugettensis***: "in freto Pugettensi, Oregoniae" (= Puget Sound, Washington State, USA). Type material in USNM, now lost.

Type locality of ***Gebia californica***: "from the coast near Monterey", California, USA. Type material probably lost.

Diagnostic Features: Rostrum ending in three teeth, the median tooth broad and triangular, the lateral teeth much shorter. A groove between the median and lateral teeth, also a very shallow median longitudinal groove. Lower surface of rostrum without spines. Anterolateral border of carapace with a very small tooth at the level of the eye. First pereiopods subchelate. Dactylus of adult male on inner surface with a longitudinal row of 6-12 tubercles, that are placed close together. Carpus with some anterior spines. Merus with a subdistal anterodorsal spine. Coxae without spines.

Geographical Distribution : N.E. Pacific region from Valdez Narrows, Alaska, USA (about 60°N) to Morro Bay, California, USA (about 35°N) (Fig. 436).

Habitat and Biology : Burrowing in muddy sand of the intertidal zone, sometimes under rocks. Burrows Y-shaped, and about 0.6 to 1.0 m deep.

Size : Total body length up to 11 cm (Williams, 1986a, who stated the males to be smaller than females). Hart (1982:53), on the contrary gave the total length as up to 15 cm (males), 10.5 cm (females).

Interest to Fisheries : The species is dug for bait in California (Frey, 1971:9, 10), perhaps also in other areas. Williams (1986a:36) listed a specimen obtained in 1876 on the "San Francisco Market". According to Hart (1982:53) the species is "of some economic importance due to burrowing activities. On certain types of oyster beds, young oysters can be smothered by the mud displaced by these animals. Also dykes designed to retain a layer of sea water may be riddled with burrows through which water drains at low tide".

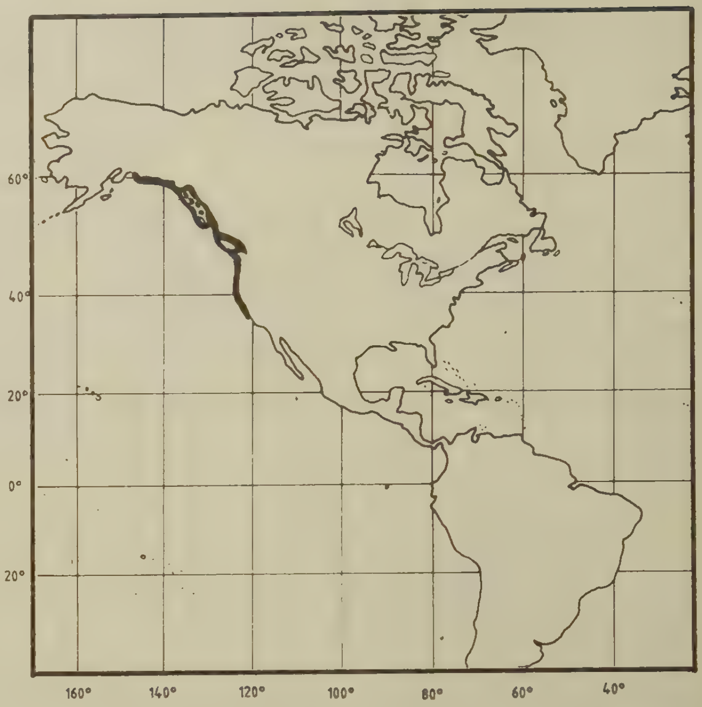


Fig. 436

Local Names : CANADA: Mud shrimp; USA: Blue mud shrimp, Marine crayfish, Puget Sound ghost crab (Washington State); Blue mud shrimp (California State).

Literature : Stevens, 1928:318-324, figs 1-5, 20-37; Williams, 1986a:35, fig. 13.

Upogebia pusilla (Petagna, 1792)

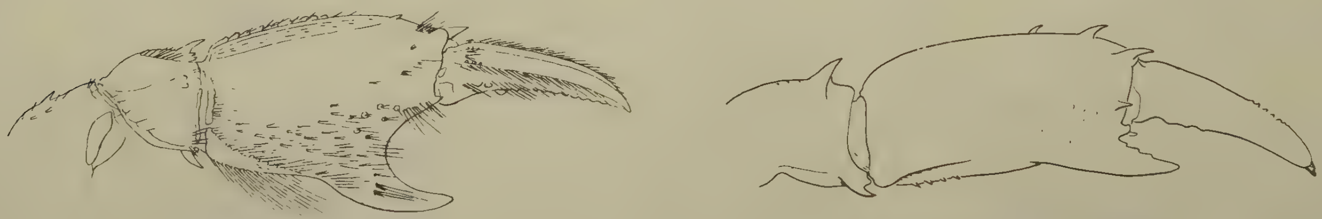
Fig. 437

UPOG Upog 4

Astacus pusillus Petagna, 1792, Institutiones Entomologicae, 1:418, pl. 5 fig. 5.

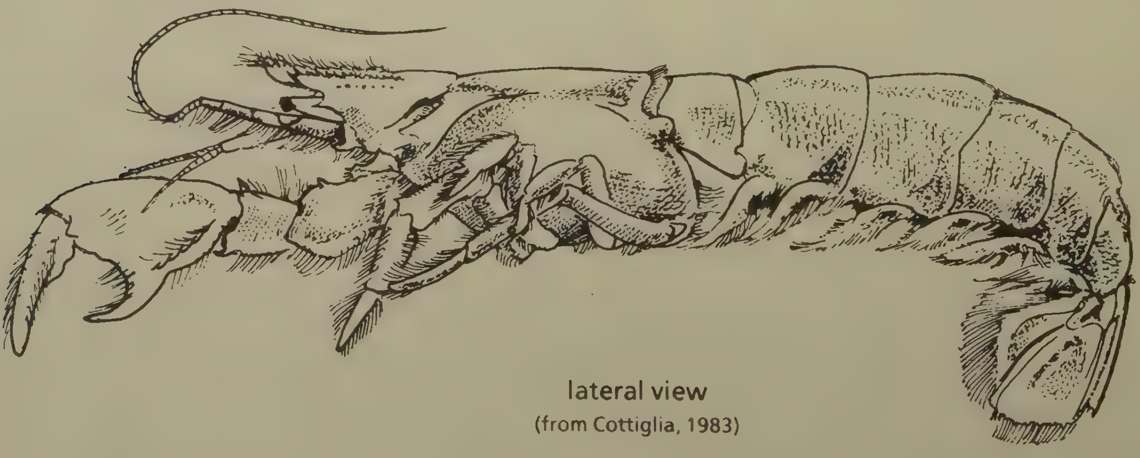
Synonyms: ***Thalassina littoralis*** Risso, 1816; ***Gebia littoralis*** - Desmarest, 1823; ***Gebios littoralis*** - Risso, 1827; ***Gebia lacustris*** Costa, 1840; ***Gebia venetiarum*** Nardo, 1869; ***Upogebia littoralis*** - Thompson, 1901.

FAO Names : **En** - Mediterranean mud shrimp.



first pereiopod of male
(from De Man, 1927)

first pereiopod of female
(from De Saint Laurent & Le Loeuff, 1979)



lateral view
(from Cottiglia, 1983)

Fig. 437

Type : Type locality of ***Astacus pusillus*** : "Habitat in nostri maris arena, sed rarior". In nostri maris obviously stands for the seas near Naples, where Petagna lived. The whereabouts of the type material is unknown, it must be considered lost.

Type locality of ***Thalassina littoralis***: "environs de Nice", dépt. Alpes Maritimes, S. France. Depository of type material unknown.

Type locality of ***Gebia lacustris***: "Vive nel fango del lago Lucrino", west of Naples, Italy. Whereabouts of type material unknown.

Type locality of ***Gebia venetiarum***: "del Veneto Estuario" "nelle nostre lagune" [= lagoon of Venice, Italy]. Depository of types unknown.

Diagnostic Features : Rostrum ending in 3 teeth, the median long with a rounded apex ending in two spines; lateral teeth short, much shorter than half the median tooth, and separated from it by a deep groove. The median groove of the median tooth shallow. No spines on the ventral surface of the rostrum. Anterolateral margin of the carapace with a small but distinct tooth at the level of the eye. First pereiopods subchelate. In the adult male the palm is distinctly widened at the base of the fixed finger, so that the height of the chela is only slightly less than the length. Movable finger with blunt tubercles on the cutting edge, but otherwise without tubercles, spines or ridges. Palm with 2 dorsal rows of spinules. Merus with a subdistal anterodorsal spine.

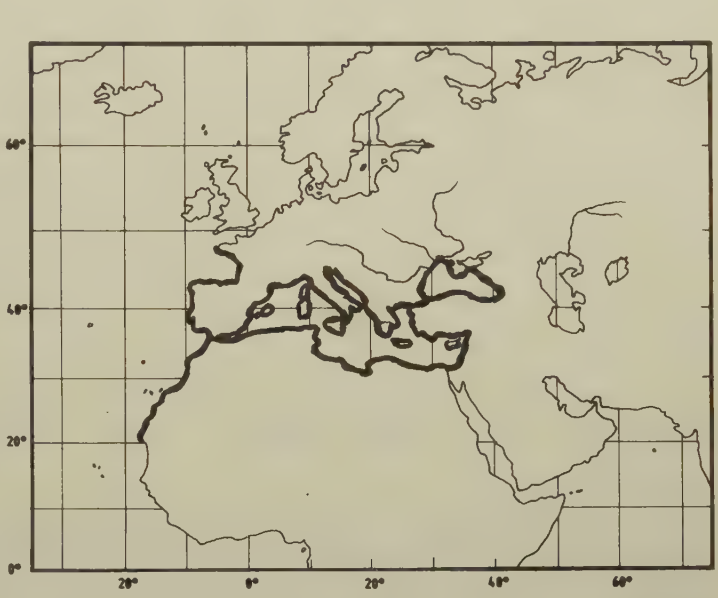


Fig. 438

Geographical Distribution : Eastern Atlantic region from Bretagne (Atlantic coast of France) to Mauritania (N.W. Africa), also in the entire Mediterranean and in the Black Sea (Fig. 438).

Habitat and Biology : Intertidal and subtidal zones down to about 45 m; sometimes in estuarine areas. The species makes simple Y-shaped burrows with 2 or more entrances in the mud or sandy mud.

Size : Total body length about 4 to 6.5 cm.

Interest to Fisheries : I found only a single reference indicating that the species is used for human consumption: Pesta (1918:199) after reporting that the animals are used for fish bait in the Adriatic sea, remarked in parentheses "(Auch gegessen!) [= it is eaten!]." On the other hand there are numerous observations that the species is used as bait for fishing. So Chaud (1984:169) remarked that on the coast of Cantabria (north coast of Spain) "la capture de ces crustacés comme excellents appâts naturels pour la pêche assure la totalité des revenus pour quelques centaines de famille", and he also suggested that the species could well be used in the laboratory as a test animal for experiments. Cottiglia (1983:79) stated that in Italy the species "viene esclusivamente usata come esca e come tale é molto ricerçata" (= it is only used as bait), more or less contradicting Pesta's statement that the animals are also used for human consumption. To obtain the animals, they are usually dug out of their burrows with spades. But when the mud is very soft, the water and the mud may be stirred with the feet so that the burrows become exposed or damaged and the animals flee and are easily picked up in the murky water. The most modern and efficient method, however, is that with a suction pump (the so-called yabbie pump; see under ***Callianassa australiensis***), with which the contents of the burrow, including the shrimp is pumped out in a quick and sudden movement. Finally there is a method by which through the application of a certain pressure the contents of the burrow is forced out; this so-called "casserole" method is described by Chaud (1984:22) and used in Arcachon (S.W. France).

Local Names : FRANCE: Crevette fouisseuse; GERMANY: Maulwurfskrebs, Strandkrebs; ITALY: Corbola, Cicaledda, Rufola, Scardobola; SPAIN: Grillo real marino; Cadell de mar (Cataluña); TURKEY: Mamun; YUGOSLAVIA: Karlic.

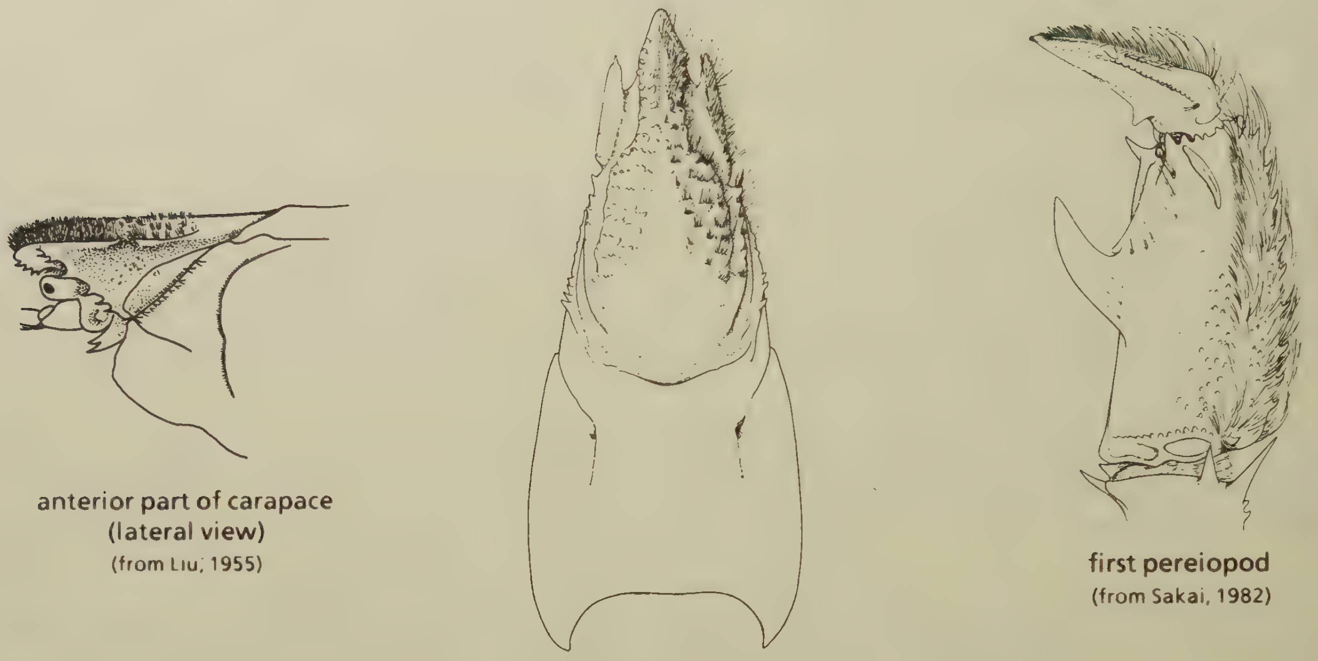
Upogebia wuhsienweni, Yu, 1931

Fig. 439

UPOG Upog 5

Upogebia wuhsienweni Yu, 1931, Bulletin Fan Memorial Institute Biology, 2(6):89, fig. 2.

FAO Names : En - Chinese mud shrimp.



anterior part of carapace (lateral view) (from Liu, 1955)

carapace (dorsal view) (from Sakai, 1982)

first pereiopod (from Sakai, 1982)

Fig. 439

Type : Type locality: "Kiaochow bay" (= Jiaozhou Wan, near Qingdao, Shandong Province, N. China) syntypes in Fan Memorial institute of Biology, Beijing, China; present whereabouts unknown.

Diagnostic Features : Rostrum ending in 3 teeth, the lateral about half as long as the median. The carina behind the lateral teeth interrupted in the male. The grooves between central and lateral teeth wide and deep. Lower surface of the rostrum with a median row of 3 to 5 spines. Anterolateral border of the carapace with several small teeth behind the eye. The first pereiopods are subchelate. The dactylus in the adult male has a longitudinal row of tubercles on either surface. The palm shows an oblique carina in the anterior part of the inner surface near the base of the dactylus. The dorsal margin of the palm has a row of 9 or 10 small teeth. The merus has a subdistal anterodorsal spine. A spine is present on the coxa.

Geographical Distribution : China: from Shandong Province (Shantung) to Fujian Province (Fukien); Taiwan Island (Fig. 440).

Habitat and Biology : Probably burrowing in the mud like the other economically important species of this genus.

Size : The types measured 3.1 and 4.6 cm and were described as being young.

Interest to Fisheries : Liu (1955:68, pl. 24 figs 7-12) included this species in his "Economic shrimps and prawns of North China", and for that reason it is mentioned here.

Literature : Sakai, 1982:59, text-figs 11d, 12f, g, 13 g, h, pl. G figs 1,2.

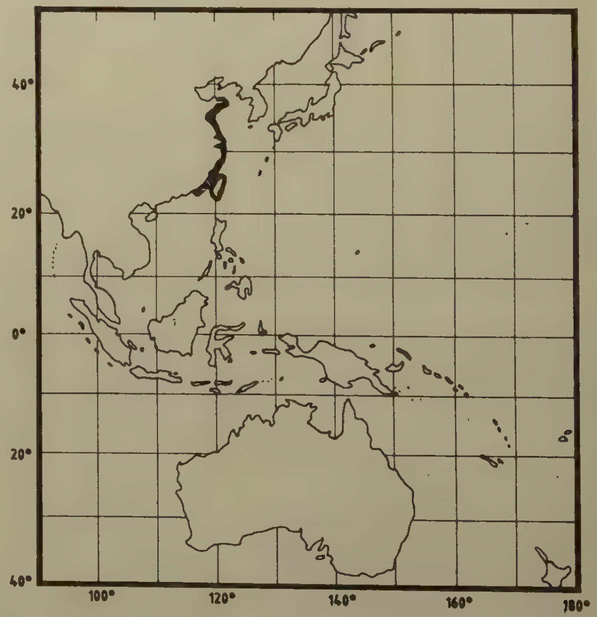


Fig. 440

2.3.3 FAMILY CALLIANASSIDAE Dana, 1852

Callianassidae Dana, 1852 Proceedings Academy Natural Sciences, Philadelphia, 6:12, 14. Name placed on the Official List of Family Names in Zoology, in Opinion 434 (published in 1956).

Recent studies of the family do not agree on the number of genera to be recognized. De Saint Laurent (1973, 1979) divided the family into 9 genera, while Poore & Griffin (1979) only recognized three, as several of their species of ***Callianassa*** s.l. could not be assigned with confidence to any of De Saint Laurent's genera. Poore & Griffin therefore only recognized the genera ***Callianassa*** Leach, 1814, ***Ctenocheles*** Kishinouye, 1926, and ***Gourretia*** De Saint Laurent, 1973, and placed all the other genera recognized by De Saint Laurent in the synonymy of ***Callianassa***. Recently, Manning & Felder (1986:437-443) redefined the genus ***Callichirus*** Stimpson, 1866, placing in it 4 species formerly assigned to ***Callianassa***; they convincingly showed ***Callichirus*** to be distinct from ***Callianassa*** s.l. None of the four species at present known to belong to ***Callichirus*** has been reported to be of economic importance.

Without taking a definite stand on the generic taxonomy of the Callianassidae, I recognize here, for purely practical reasons, only the genera ***Callianassa, Callichirus, Ctenocheles*** and ***Gourretia***. All species reported to be of interest to fisheries belong to the genus ***Callianassa*** s.l. as accepted here.

Callianassa Leach, 1814

CALL Call

Callianassa Leach, 1814, Brewster's Edinburgh Encyclopaedia, 7:400. Gender feminine. Name placed on the Official List of Generic Names in Zoology by the International Commission on Zoological Nomenclature in their Opinion 434 (published in 1956).

Type Species: by monotypy: ***Cancer (Astacus) subterraneus*** Montagu, 1808. Gender feminine. Name placed on the Official List of Generic Names in Zoology by the International Commission on Zoological Nomenclature in their Opinion 434 (published in 1956).

Synonyms: ***Montagua*** Leach, 1814, Brewster's Edinburgh Encyclopaedia, 7:436. Type species, by monotypy: ***Cancer (Astacus) subterraneus*** Montagu, 1808. Gender feminine.

Gebios Risso, 1822, Journal de Physique, de Chimie, d'Histoire naturelle et des Arts, 95:243. Type species, by monotypy: ***Gebios davianus*** Risso, 1822 (= junior subjective synonym of ***Cancer candidus*** Olivi, 1792). Gender masculine.

Gebius Agassiz, 1846, Nomenclator Zoologicus Index universalis:160. Emendation of ***Gebios*** Risso, 1822. Gender masculine.

Trypaea Dana, 1852, Proceedings Academy Natural Sciences, Philadelphia, 6:14,19. Type species, by monotypy: ***Trypaea australiensis*** Dana, 1852. Gender feminine.

Mesostylus Bronn & Roemer, 1852, Lethaea geognostica (ed.3) 2 (5):353. Type species, by monotypy: ***Pagurus faujasi*** Desmarest, 1822. Gender masculine.

Glypturus Stimpson, 1866, Proceedings Chicago Academy Sciences, 1:46. Type species, by monotypy: ***Glypturus acanthochirus*** Stimpson, 1866. Gender masculine.

Cheramus Bate, 1888, Report Voyage Challenger (Zool.), 24:x, xi, xlvi, lxxv, 7, 10, 26, 28,30, 36. Type species, by present designation: ***Cheramus orientalis*** Bate, 1888. Gender masculine.

Scallasis Bate, 1888, Report Voyage Challenger (Zool.), 24:xi, lxxv, 7, 10, 28, 34, 36. Type species, by monotypy: ***Scallasis amboinae*** Bate, 1888. Gender feminine.

Calliactites Borradaile, 1903, Annals Magazine Natural History, (7)12:54. Type species, by original designation: ***Callianassa secura*** Lanchester, 1902. Gender masculine.

Lepidophthalmus Holmes, 1904, Proceedings California Academy Sciences, (3)3:311. Type species, by monotypy: ***Lepidophthalmus eiseni*** Holmes, 1904 (= a subjective junior synonym of ***Callianassa bocourti*** A. Milne Edwards, 1870). Gender masculine.

Calliax De Saint Laurent, 1973, Comptes Rendus hebdomadaires séances Académie Sciences, Paris, (D) 277:514. Type species, by original designation and monotypy: ***Callianassa lobata*** De Gaillarde & Lagardère, 1966. Gender feminine.

Callianopsis De Saint Laurent, 1973, Comptes Rendus hebdomadaires séances Académie Sciences, Paris, (D) 277:515. Type species, by original designation and monotypy: ***Callianassa goniophthalma*** Rathbun, 1901. Gender feminine.

Anacalliax De Saint Laurent, 1973, Comptes Rendus hebdomadaires séances Académie Sciences, Paris, (D)277:515. Type species, by original designation and monotypy: ***Callianassa argentinensis*** Biffar, 1971. Gender feminine.

Calliapagurops De Saint Laurent, 1973, Comptes Rendus hebdomadaires séances Académie Sciences, Paris, (D)277:515. Type species, by original designation and monotypy: ***Calliapagurops charcoti*** De Saint Laurent, 1973. Gender masculine.

Paracalliax De Saint Laurent, 1979, Comptes Rendus hebdomadaires séances Académie Sciences, Paris, (D)288:1396. Type species, by original designation and monotypy: ***Paracalliax bollorei*** De Saint Laurent, 1979. Gender feminine.

Of the many (about 150) species of Callianassidae known at present, only 9 have, to my knowledge, been reported as being of interest to fisheries (either as bait or for human consumption). These 9 species are the only ones dealt with in this catalogue. Of each, a short morphological account of the most salient diagnostic features is given.

Eight of these nine species seem to be used exclusively as bait, while the ninth, ***Callianassa turnerana***, is used as food for humans in W. Africa. However, since most publications on Callianassids do not provide information on utilization, it seems likely that many more species actually are used as bait. It seems obvious that any species occurring in dense populations in the littoral or sublittoral zones and can easily be taken by digging or by suction pumps, is hence a likely candidate for bait. The present catalogue therefore may be quite incomplete and any additional information will be welcome.

The species of ***Callianassa*** are burrowers in mud or in muddy sand. They are characterized by their elongate, soft body covered by a thin integument. The carapace is smooth and glabrous, on the abdominal pleura a tuft of hairs may be present, but otherwise the abdomen is also smooth and naked. The rostrum usually is small and does not reach beyond the eyes, it is triangular, or conical and sometimes reduced to a low central angle of the anterior margin of the carapace; in some species, however, it ends in 3 or 5 large teeth. The eyes are small, placed close to each other, sometimes with the inner margins touching. The pereiopods of the first pair are large and asymmetrical, and have well developed chelae. The legs of the second pair are small, also chelate. The following legs are simple. The abdomen is longer than the carapace.

Callianassa australiensis (Dana, 1852)

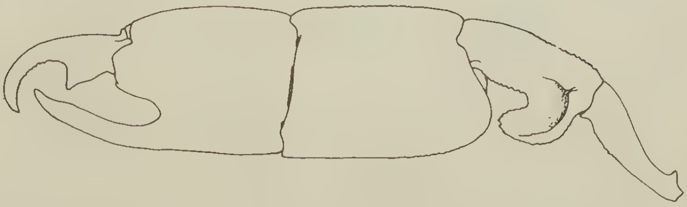
Fig. 441

CALL Call 1

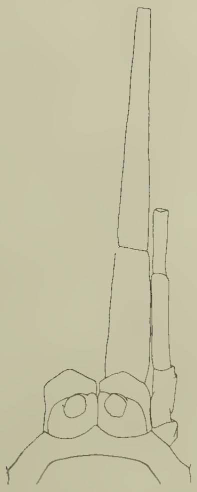
Trypaea australiensis Dana, 1852, Proceedings Academy Natural Sciences, Philadelphia, 6:19.

Synonyms: ***Trypaea porcellana*** Kinahan, 1856.

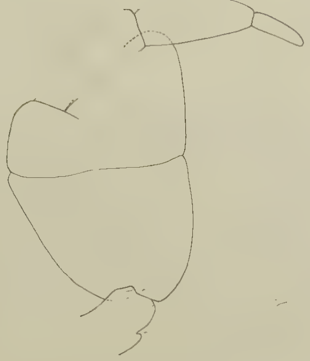
FAO Names: **En** - Australian ghost shrimp.



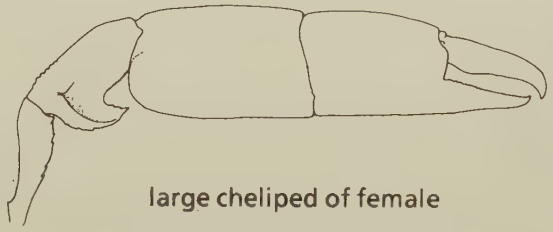
large cheliped of male



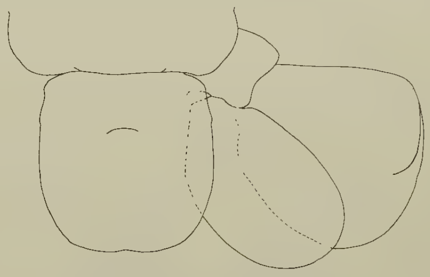
anterior part of body
(dorsal view)



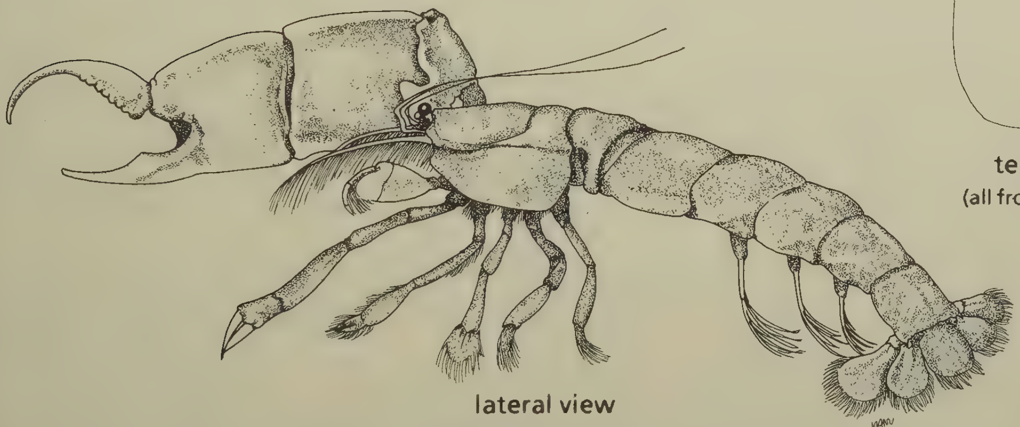
third maxilliped



large cheliped of female



telson and uropods
(all from Poore & Griffin, 1979)



lateral view
(after Grant, 1978)

Fig. 441

Type: Type locality of ***Trypaea australiensis***: "in oris Illawarrae Australiae orientalis" (= mouth of Illawarra Lake, S. of Sydney, New South Wales, Australia). Types in USNM, now lost.

Type locality of ***Trypaea porcellana***: "washed up at St Kilda" (= St. Kilda, 37°52'S 144°59'E, at present a district of Melbourne, Victoria, Australia). Two syntypes in NMI.

Diagnostic Features: Rostrum a short, blunt and wide triangle, far overreached by the squarish eyes (almost with their full length). No antennal spine, but antennal angle low, broad and rounded. Antennular peduncle reaching with more than half the length of the third segment beyond the antennal peduncle. Third maxilliped with merus and ischium strongly widened, forming an operculum; distal three segments all narrow, each three times or more longer than wide. Large chela in adult male with a deep concavity in the anterior margin of the palm just above the base of the fixed finger. Carpus about as long as the palm and slightly longer than high. Merus with a large, curved, bluntly rounded lobe in the basal part of the lower margin. Telson quadrangular, longer than wide with broadly rounded posterolateral angles, without spines. Endopod of uropod broadly oval, only slightly longer than telson.

Geographical Distribution : E. and S.E. Australia, from Townsville (N. Queensland) to Port Phillip Bay (Victoria). The most abundant Callianassid in E. Australia (Fig. 442).

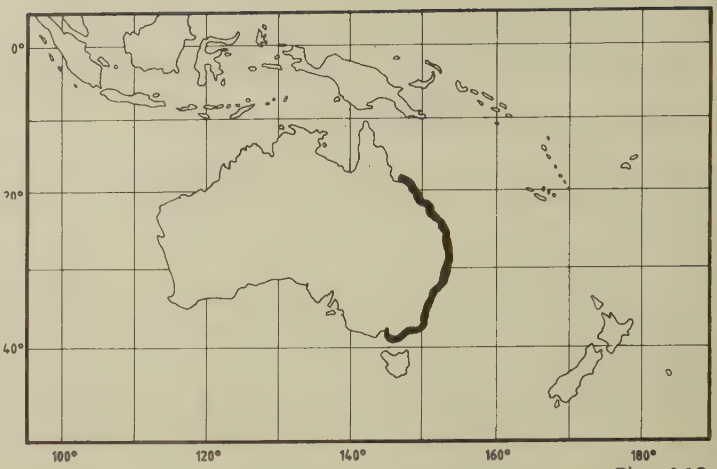


Fig. 442

Habitat and Biology : On intertidal sand- or mud-flats, often in or near estuaries. The animals burrow in the soft substratum.

Size : Total body length 1.5 to 6 cm.

Interest to Fisheries : In E. Australia the species is extensively used as bait for fishing. The so-called yabbie-pumps received their name from the Australia bait collectors, who were the first to use this suction pump for collecting these burrowing animals. As described by Hailstone (1962:29-30) there are 3 types of yabbie-pumps (also called slurp guns). Two of these types are manual and are "essentially coring tubes, which, when pushed into the sand and extracted, remove a core of about 2 ft. [= about 60 cm] in length and from 2 in. to 4 in. [= 5 to 10 cm] in diameter. Either pump is then reinserted in the hole so formed and suction is applied (with the aid of a plunger in one model or by closing off all air outlets and withdrawal of the pump in the other model). As a results of this suction, water, sand and yabbies are drawn into the hole and removed " (Hailstone, 1962:30). The third type is motor-driven and "works on the reverse principle, i.e.,water under pressure is driven deeply into the sand and yabbies are flooded to the surface". The pump with the plunger is now used extensively in many parts of the world for collecting burrowing Crustacea from sandy or muddy substrates in the intertidal and subtidal zones as described by Manning (1975:318-319).

Local Names : AUSTRALIA: Marine yabbie, Burrowing shrimp, Ghost nippers.

Literature : Hailstone & Stephenson, 1961:259-285; Poore & Griffin, 1979:250-256, figs 18-20.

Callianassa biffari nom. nov.

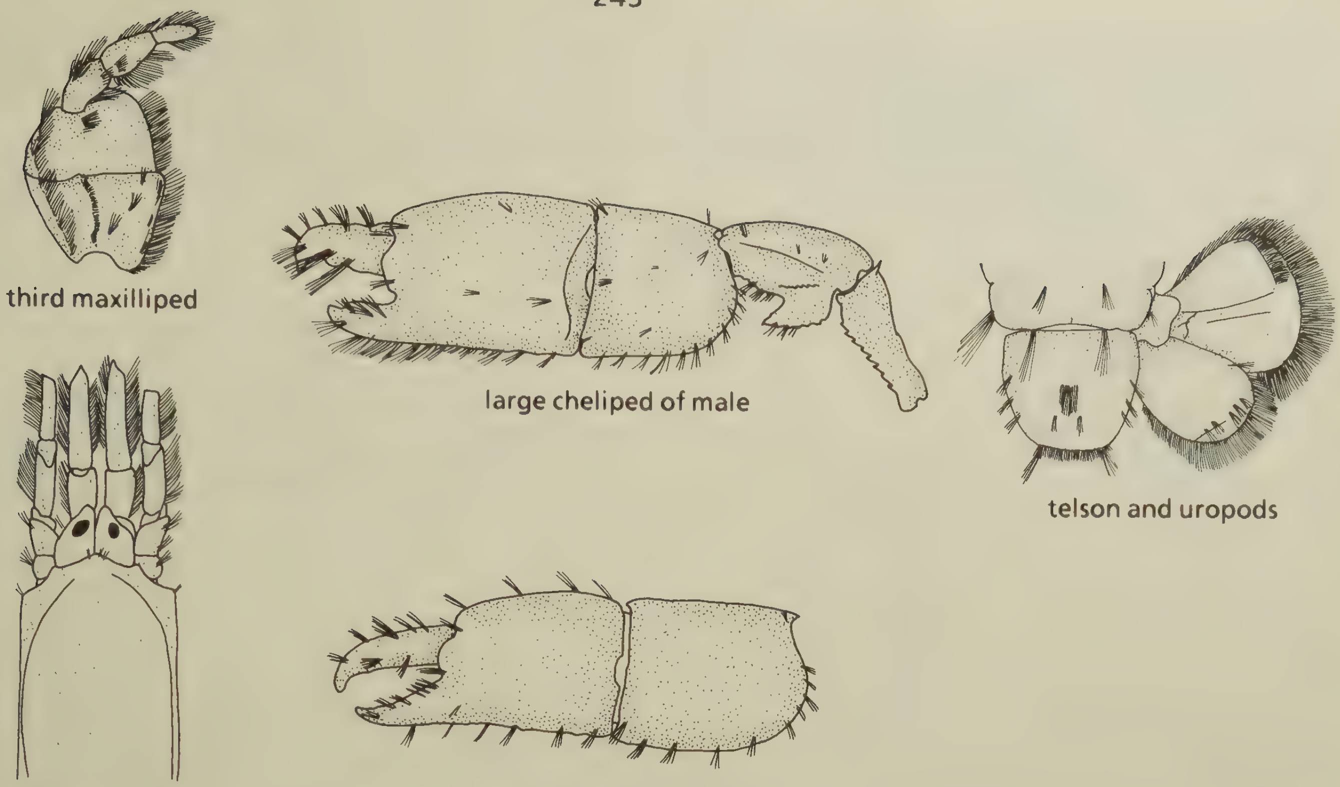
Fig. 443

CALL Call 2

Callianassa biffari new name for ***Callianassa affinis*** Holmes, 1900, Occasional Papers California Academy Sciences, 7:162 (a junior primary homonym of ***Callianassa affinis*** A. Milne Edwards, 1860, Annales Sciences Naturelles, Paris, (Zool.) (4)14:188).

Synonyms: Biffar (unpubl. Ph.D. thesis, 1972, University of Miami) pointed out that the well known name ***Callianassa affinis*** Holmes, 1900 for a species from California is a junior primary homonym of ***Callianassa affinis*** A. Milne Edwards, 1860, for a fossil species from the Lutetian of Central France (Parnes). Biffar indicated the species as "***Callianassa*** sp. A, new name". So far as is known to me no subsequent author has proposed a replacement name for the species (most continued to use the name ***affinis*** for it). As Dr Biffar informed me, circumstances beyond his control forced him to end his carcinological researches, and he will not be able to propose a new name himself. Therefore I believe it best to propose such a name here. It gives me great pleasure to dedicate this species to Dr Biffar, who was the first to discover the homonymy, and who has done so much useful work in Decapod taxonomy.

FAO Names : En - Beach ghost shrimp.



third maxilliped

large cheliped of male

telson and uropods

anterior part of body (dorsal view)

large cheliped of female

(all after Biffar, unpubl.)

Fig 443

Type : Type locality (for *C. affinis* and thus also for *C. biffari*): "Point Loma, Calif." (= Point Loma near San Diego, southern California, USA). Lectotype male in USNM, no. 86810; 2 paralectotypes, probably lost.

Diagnostic Features : The rostrum is a low blunt angle in the median part of the anterior margin of the carapace, being overreached by the eyes with practically their full length. The eyes are triangular with a blunt top. The antennal angles are low, rounded, without tooth. Antennular peduncle only slightly longer than antennal peduncle. Third maxilliped with ischium and merus strongly widened to form a kind of operculum; the distal three segments much narrower, each about twice as long as wide. Large chela in adult male with a small concavity above the base of the fixed finger. Carpus slightly shorter than palm, about as high as long. Lower margin of merus with a broad forward directed hook-shaped process, which ends in a triangular top. Telson about as long as wide, gradually narrowing posteriorly: the convex lateral margins merge evenly with the posterior margin. Each posterolateral angle bears two very small denticles, no median denticle present. Endopod of uropod broadly oval, slightly longer than telson.

Geographical Distribution : Eastern Pacific region: Santa Monica Bay (California, USA) to San Quintin Bay (N.W. Baja California, Mexico) (Fig. 444).

Habitat and Biology : On open beaches with a rocky boulder-covered shore (Frey, 1971:9). The species thus has a preference for a different habitat from those chosen by *C. californiensis* and *C. gigas* (see there). The species constructs rather complicated burrows in the soft sandy substratum.

Size : Total body length 2.5 to 6 cm.

Interest to Fisheries : In California the species is used as bait together with *C. californiensis* and *C. gigas,* and in the accounts of the bait fishery the three are usually treated together. *C. californiensis* is the most important of the three (see there for further details). The burrows of *C. biffari* are often among rocks, which first have to be removed before digging can start.

Local Names : USA: Beach ghost shrimp, Ghost shrimp (California).

Literature : Haig & Abbott, 1980:580, fig. 24.3.

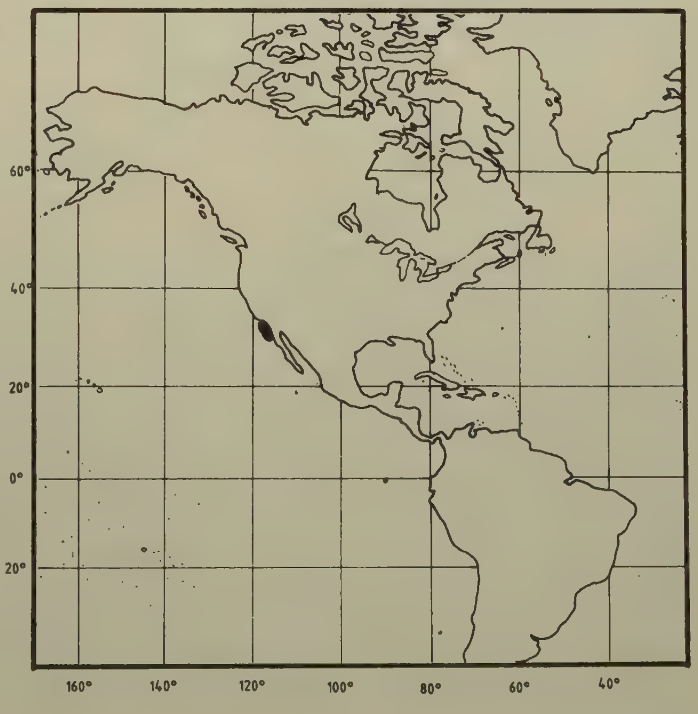


Fig. 444

Callianassa californiensis Dana, 1854

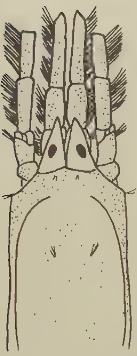
Fig. 445

CALL Call 3

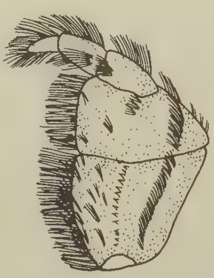
Callianassa californiensis Dana, 1854, Proceedings Academy Natural Sciences, Philadelphia, 7:175.

Synonyms : *Callianassa occidentalis* Stimpson, 1856.

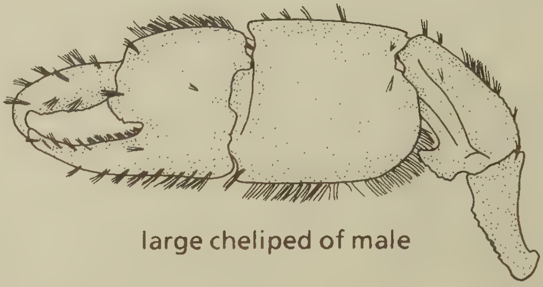
FAO Names : En - Bay ghost shrimp.



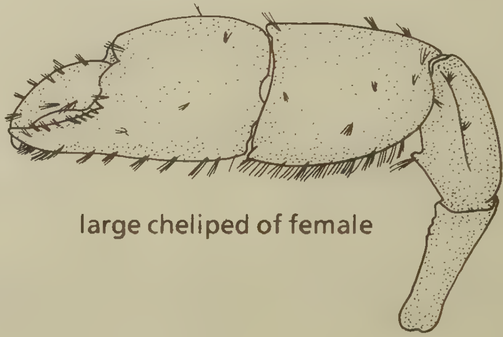
anterior part of body (dorsal view)



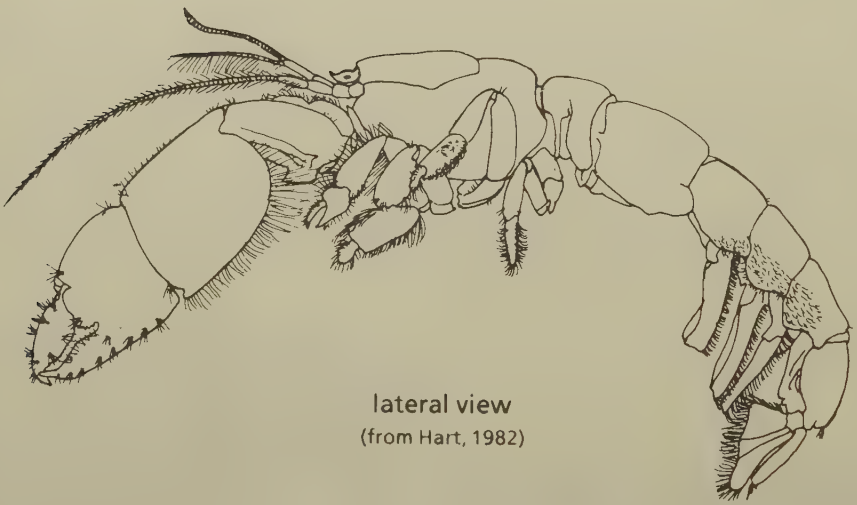
third maxilliped



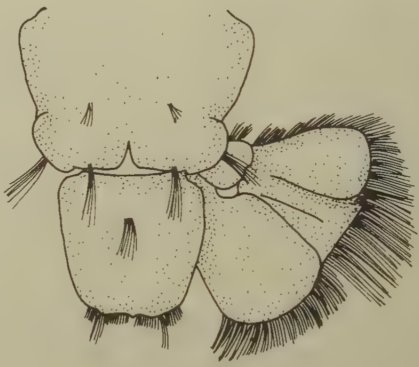
large cheliped of male



large cheliped of female



lateral view (from Hart, 1982)



telson and uropods (all after Biffar, unpubl.)

Fig. 445

Type : Type locality of ***C. californiensis***: "California". Type material in USNM, now lost.

Type locality of ***C. occidentalis***: "This species lives in the holes which are seen in such numbers at low water on the smooth sandy beaches near the entrance of San Francisco Bay", California USA. Type material now lost.

Diagnostic Features : Rostrum hardly noticeable, a slight angle in the anterior margin of the carapace. Eyes triangular, reaching with their full length beyond the rostrum. Antennal angles rounded, without spine. Antennal peduncle somewhat shorter than antennular. Third maxilliped with merus and ischium strongly widened to an operculum; last three segments far narrower, each about twice as long as wide. Large chela of adult male with a distinct concavity in the anterior margin of the palm above the base of the fixed finger; this concavity absent or inconspicuous in females and juvenile males. Carpus about as long as the palm, and about as high as long. Merus with a distinct broad and bluntly truncated process in the basal part of the lower margin; in the female this process is more in the shape of a triangular tooth. Telson about quadrangular, longer than wide and slightly and gradually narrowing posteriorly; the posterolateral angles are broadly rounded; the posterior margin shows a small triangular tooth in the middle; no other teeth or spines are present. Endopod of uropod squarish with rounded angles, slightly longer than the telson.

Geographical Distribution : Eastern Pacific from Alaska (USA) to northwestern Baja California, Mexico (Fig. 446).

Habitat and Biology : In tidal flats of sand and mud on the sea coasts and in estuarine areas. The animals make their burrows in the soft substrate.

Size : Total body length up to about 11.5 cm

Interest to Fisheries : The species (together with *C. biffari* and *C. gigas*) is collected as bait for fishing along the California coast, and sold as such in bait shops. The animals are dug out with spades and forks, or by "stomping the mud over the burrow entrance which puddles the mud, seals off the burrow, and forces the shrimp to swim to the surface where it can be easily picked up" (Turner & Sexsmith, 1964:37).

Local Names : USA: Bay ghost shrimp, Ghost shrimp, Saltwater crayfish (California).

Literature : Stevens, 1928:333-340, figs 10-13, 16-17, 55-71; Frey, 1971:9-10.

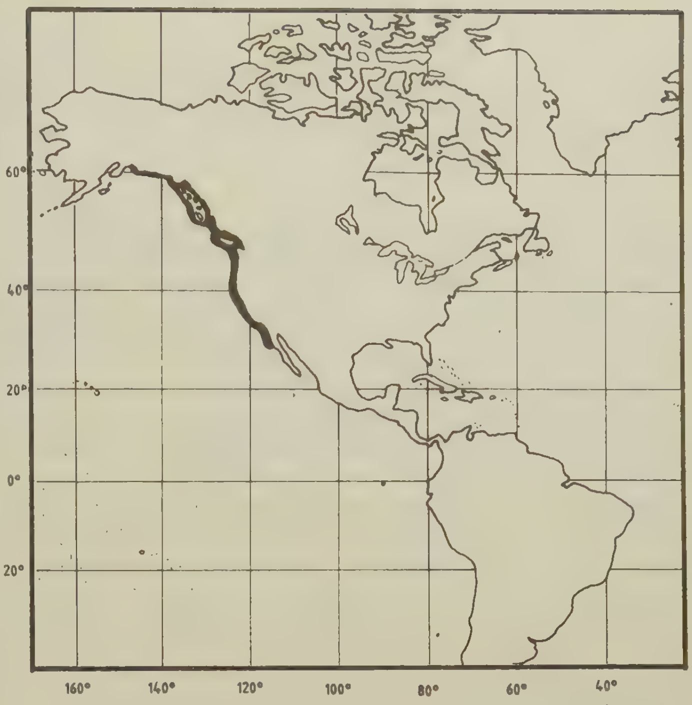


Fig. 446

Callianassa gigas Dana, 1852

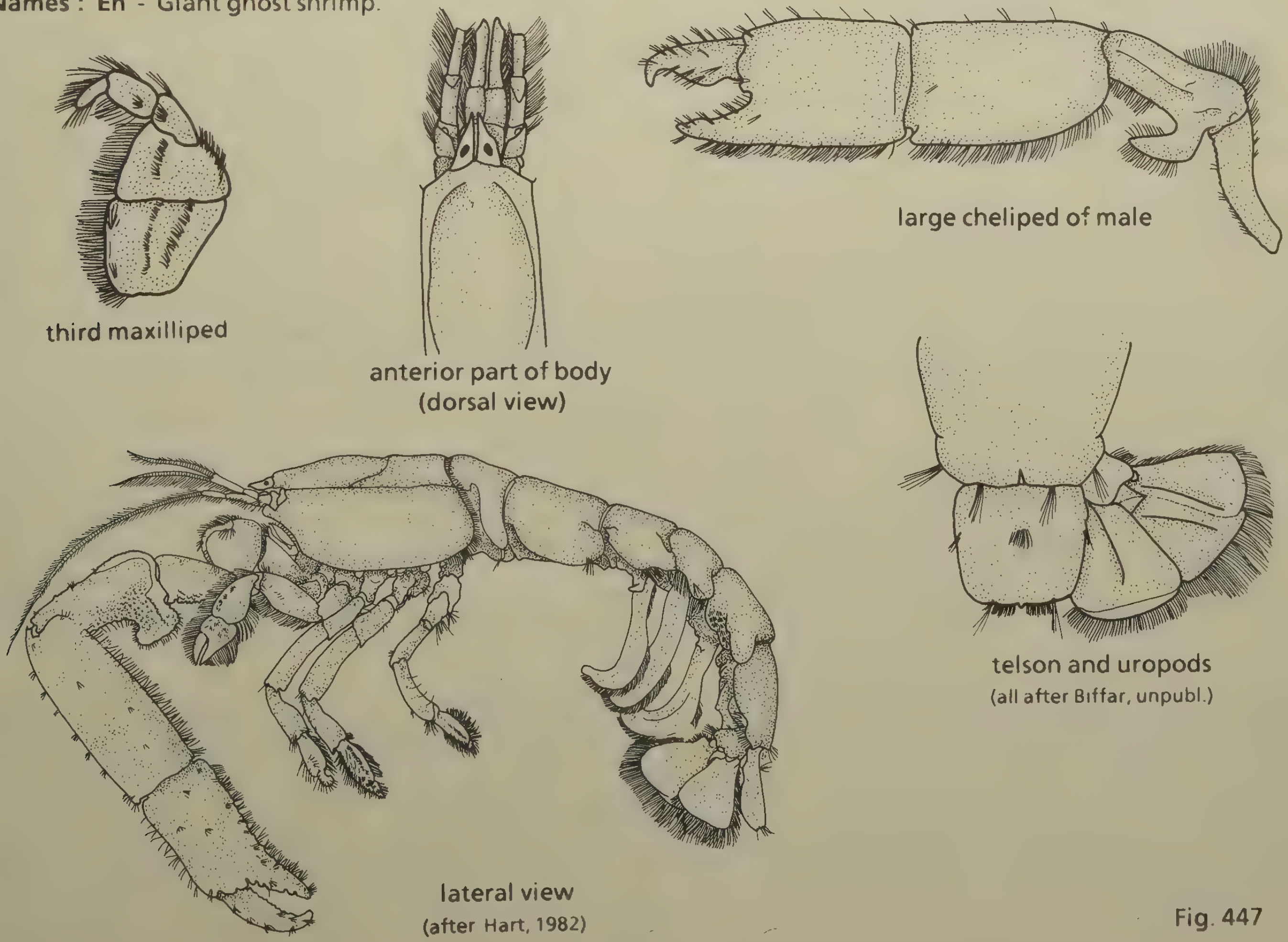
Fig. 447

CALL Call 4

Callianassa gigas Dana, 1852, Proceedings Academy Natural Sciences, Philadelphia, 6:19.

Synonyms: ***Callianassa longimana*** Stimpson, 1857; ***Callianassa (Trypaea) gigas*** - Borradaile, 1903; ***Callianassa (Trypaea) longimana*** - Borradaile, 1903

FAO Names : **En** - Giant ghost shrimp.



third maxilliped

anterior part of body (dorsal view)

large cheliped of male

telson and uropods
(all after Biffar, unpubl.)

lateral view
(after Hart, 1982)

Fig. 447

Type : Type locality of *C. gigas*: "in freto Pugettensi, Oregoniae" (= Puget Sound, Washington State, USA). Type in USNM, now lost.

Type locality of *C. longimana*: "Puget Sound" (= Steilacoom on Puget Sound between Tacoma and Olympia, Washington State, USA). Type material in the Museum of the Boston Society of Natural History, in ANSP (not located in 1989), and in USNM (lost).

Diagnostic Features : Rostrum a low median angle on the anterior margin of the carapace. Eyes elongate triangular, pointed, reaching with their full length beyond the rostrum. Antennal angles blunt, without spine. Antennal peduncle practically as long as the antennular peduncle. Third maxilliped with merus and ischium strongly expanded forming an operculum; the last three segments of the maxilliped less than half as wide as the merus, but not very slender, twice or less than twice as long as wide. Large chela of adult male with the concave part of the anterior margin of the palm above the base of the fixed finger absent or hardly noticeable. Carpus distinctly longer than palm. Merus with a large and rather wide hook-shaped process in the basal part of the lower margin; in the females this process is reduced to a small triangular tooth. Telson quadrangular, longer than wide and slightly narrowing posteriorly; posterolateral angles rounded. Posterior margin with a small triangular median denticle; no other spines or teeth on telson. Endopod of uropod broad, quadrangular or slightly triangular, with rounded angles and slightly longer than telson.

Geographical Distribution : Eastern Pacific region from Vancouver Island (British Columbia, Canada) to San Quintin Bay (N.W. Baja California, Mexico) (Fig. 448).

Habitat and Biology : Lower intertidal zone of tidal flats on the sea coast and in estuaries. Burrowing in soft substrate of sand and mud. The species is less frequent than *C. californiensis*, which lives in the same habitat.

Size : Total body length about 12.5 to 15 cm; a larger species than *C. californiensis.*

Interest to Fisheries : Like *C. californiensis* and *C. biffari*, the present species is taken as fish bait on the California coast and sold in bait shops. The animals are caught in the same way as *C. californiensis*.

Local Names : USA: Ghost shrimp, Long-handed ghost shrimp.

Literature : Stevens, 1928:325-333, figs 6-9, 14-15, 38-54.

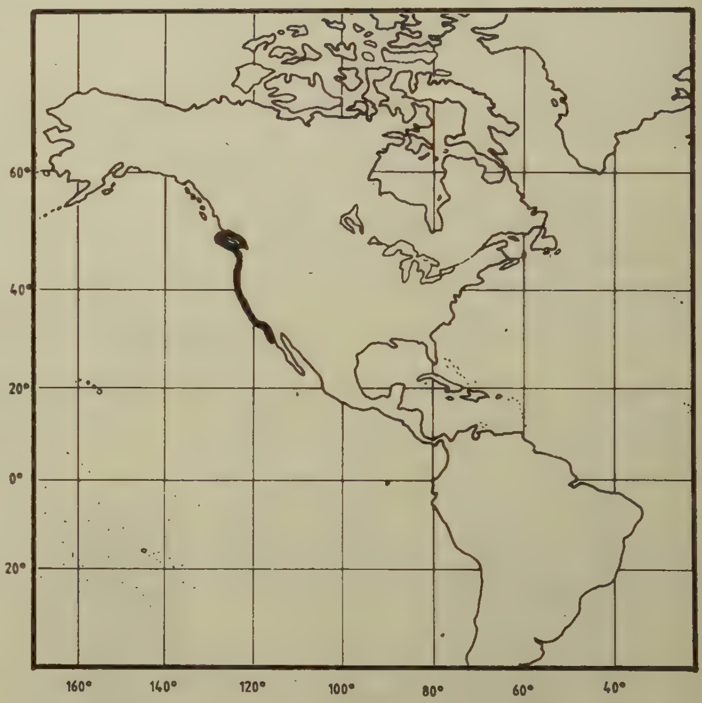


Fig. 448

Callianassa japonica Ortmann, 1891

Fig. 449

CALL Call 5

Callianassa subterranea japonica Ortmann, 1891, Zoologische Jahrbücher (Systematik, Geographie und Biologie), 6:56.

Synonyms: ***Callianassa harmandi*** Bouvier, 1901; ***Callianassa californiensis japonica*** Bouvier, 1901; ***Callianassa (Trypaea) harmandi*** - Borradaile, 1903; ***Callianassa (Trypaea) japonica*** - Borradaile, 1903; ***Callianassa californiensis bouvieri*** Makarov, 1938.

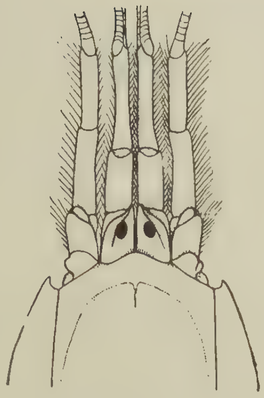
FAO Names : **En** - Japanese ghost shrimp.

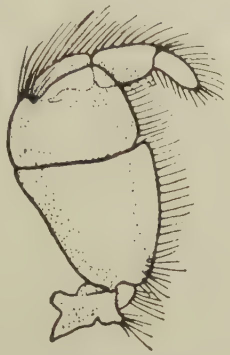
Type : Type locality of *C. subterranea japonica*: "Japan, Tokiobai"; holotype female, in MZS, preserved in alcohol, condition very poor.

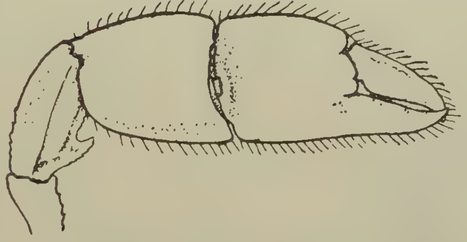
Type locality of *C. harmandi*: "Japon"; syntypes (1 male, 3 females) in MP, no. Th 80, in alcohol, condition mediocre.

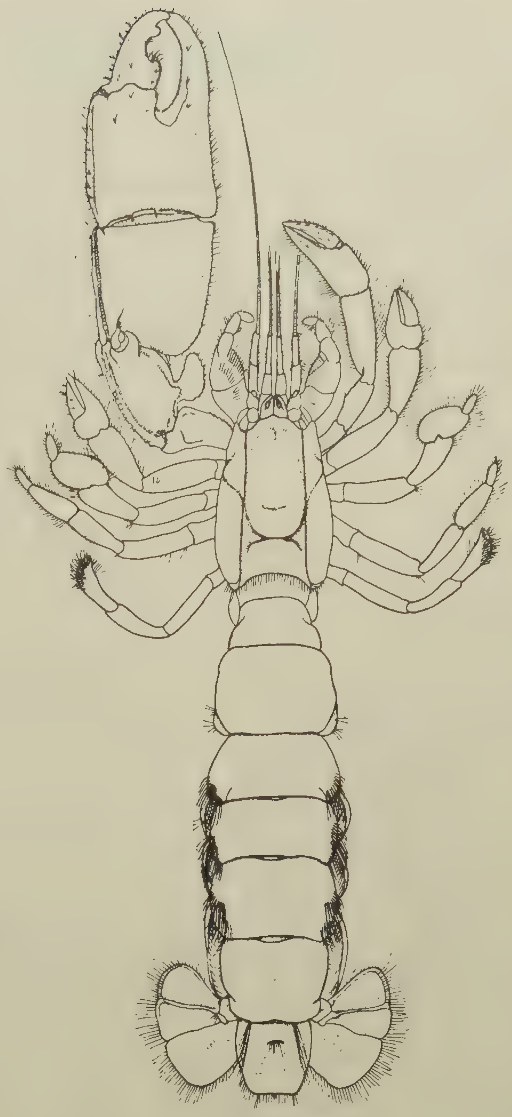
Type locality of *C. californiensis japonica* (and *C. c. bouvieri*, which is its replacement name): "Japon"; holotype female in MP, no. Th 70, in alcohol, condition rather good.

Diagnostic Features: Rostrum a low blunt angle of anterior margin of carapace. Eyes triangular, overreaching rostrum with their full length. Antennal spine absent, antennal angle inconspicuous and blunt. Peduncles of antennula and of antenna of about same length. Third maxilliped with merus and ischium considerably widened, forming an operculum; the last three segments narrow, about twice as long as wide. Large chela of adult male with a distinct concavity in the anterior margin above the base of the fixed finger; in females and young males this concavity is absent or insignificant. Carpus about as long as palm and about as long as high. Merus of adult males with a distinct rounded, forwards produced lobe in basal half of lower margin, upper margin of merus serrate; in females and young males the lobe is much smaller, more triangular, upper margin of merus smooth or indistinctly serrate. Telson longer than wide at base, quadrangular in outline, narrowing slightly posteriorly; posterolateral angles rounded. A small denticle present in the middle of the posterior margin, otherwise telson unarmed. Endopod of uropod broadly quadrangular with rounded corners, slightly longer than telson.


anterior part of body (dorsal view)


third maxilliped


large cheliped of female


dorsal view

(all from Liu, 1955)

Fig. 449

Geographical Distribution : Western Pacific region: S.E. Siberia, Korea, N. China and Japan (Fig. 450). Also found in fossil state in Japan.

Habitat and Biology : On intertidal mud flats in protected habitats. The animal makes its burrows in the soft substrate.

Size : Total body length 1.2 to 6 cm, rarely 7 cm. Ovigerous females with a body length of 2.5 to at least 5 cm.

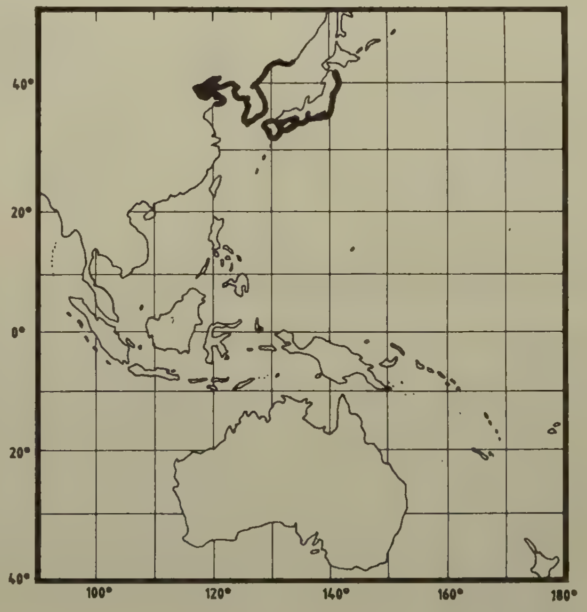


Fig. 450

Interest to Fisheries : Supposedly this species, like most other ***Callianassa*** listed here, is used as bait for fishing. The only mention of its economic importance known to me is that by Liu (1955:63, pl. 23 figs 1-5) who included the species (under the name ***Callianassa harmandi***) in his "Economic Shrimps and Prawns of North China".

Local Names : JAPAN: Nihon-suna-moguri.

Callianassa kraussi Stebbing, 1900

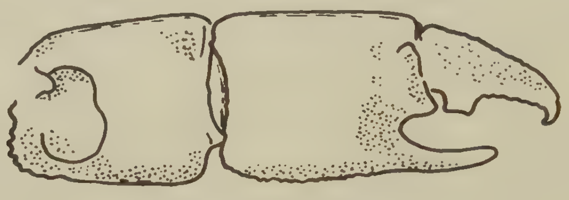
Fig. 451

CALL Call 6

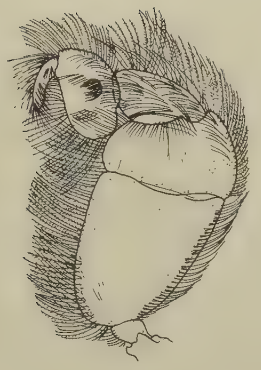
Callianassa kraussi Stebbing, 1900, Marine Investigations in South Africa, 1:39, pls 2, 3.

Synonyms: ***Callichirus kraussi*** - Stebbing, 1910

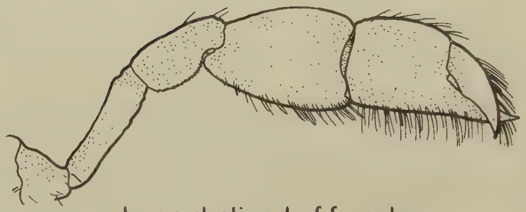
FAO Names : En - Pink ghost shrimp.



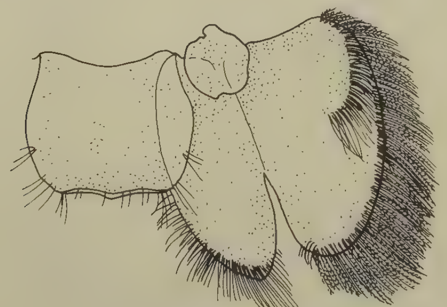
large cheliped of male
(after Barnard, 1950)



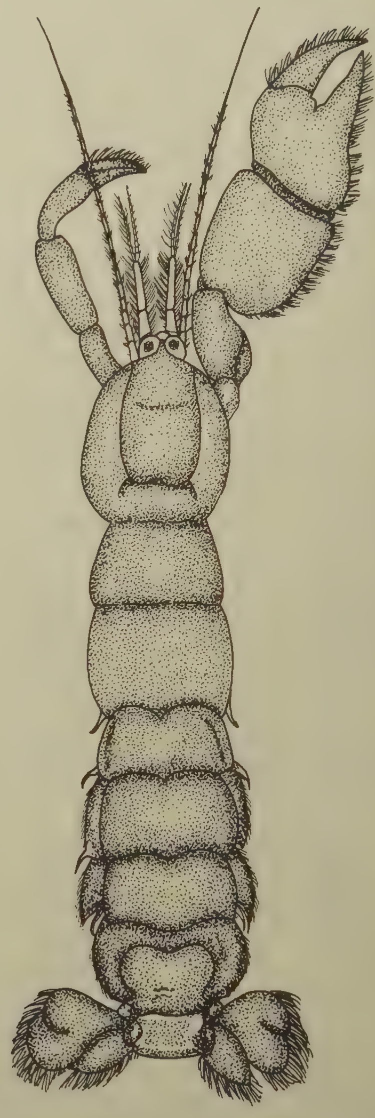
third maxilliped



large cheliped of female



telson and uropods



dorsal view

(all after Stebbing, 1900) Fig. 451

Type : Type locality: "Cape of Good Hope, Gordon's Bay, a little below high water mark". Syntypes in SAM.

Diagnostic Features : Rostrum broadly triangular, far overreached by the eyes that are oval. Antennal angle low and blunt, without spine. Antennular peduncle much longer than antennal peduncle, which it overreaches with more than half the length of the last segment. Third maxilliped with merus and ischium strongly widened to form an operculum. Carpus somewhat widened, being less than twice as long as wide; propodus strongly widened, being wider than long; dactylus slender. Large chela of adult male with a deep, but rather wide concavity in the anterior margin of the palm above the fixed finger. Carpus about as long as palm, and as long as high. Merus with a rounded lobe in basal part of lower margin. Surface of larger cheliped with numerous tubercles. Telson distinctly wider than long and much shorter than uropods, being only somewhat more than half as long as endopod. Lateral margins of telson convex, posterolateral corners rounded, posterior margin almost straight, without a spine. Endopod of uropod elongate oval.

Geographical Distribution : Southern Africa from Lambert's Bay (west coast of Cape Province, South Africa) to Delagoa Bay (= Bay of Lourenço Marques, Mozambique) (Fig. 452).

Habitat and Biology : Littoral zone to 0.5 m deep, in sheltered bays and estuaries. Substrate sand, in which it digs its burrows, the populations usually are very dense.

Size : Total body length up to 7 cm.

Interest to Fisheries : Day (1969:108) mentioned that in South Africa the species is considered as forming "good bait" and it is partially protected in so far, that only 50 specimens can be taken per person per day, while the use of spades and forks is prohibited (but yabbie pumps are not). The importance of the species as bait in southern Africa also is demonstrated by the fact that when in 1984 Ciskei issued a series of 4 stamps figuring bait animals, the 11 c stamp showed the present species.

Local Names : SOUTH AFRICA: Pienkgarnaal, Pink prawn, Sand prawn.

Literature : Barnard, 1950:506-509, fig. 94.

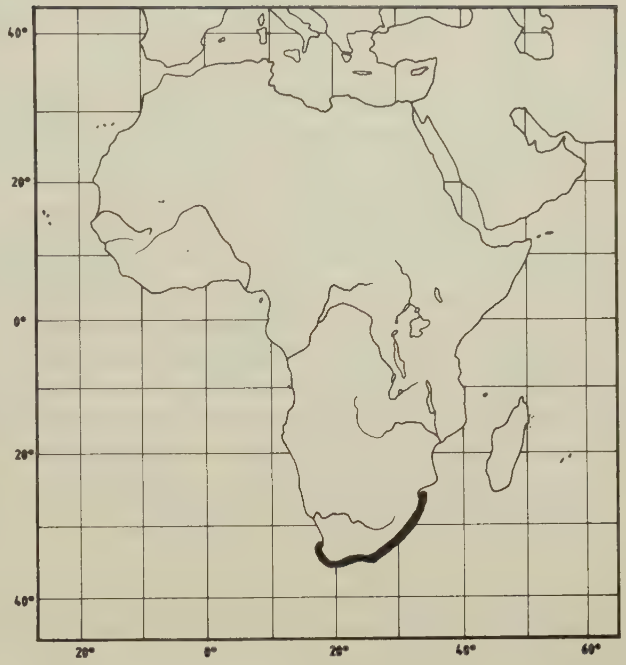


Fig. 452

Callianassa petalura Stimpson, 1860

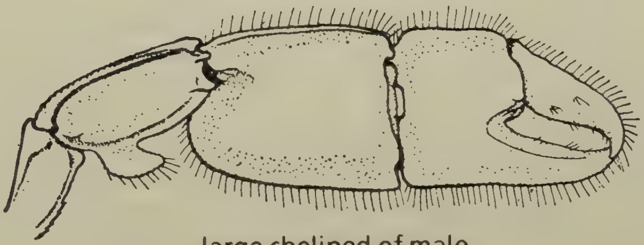
Fig. 453

CALL Call 7

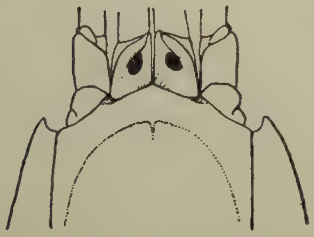
Callianassa petalura Stimpson, 1860, Proceedings Academy Natural Sciences, Philadelphia, 1860:23.

Synonyms: ***Callianassa (Trypaea) petalura*** - Borradaile, 1903; ***Callianassa gigas japonica*** Makarov, 1935; ***Callianassa gigas eoa*** Makarov, 1938.

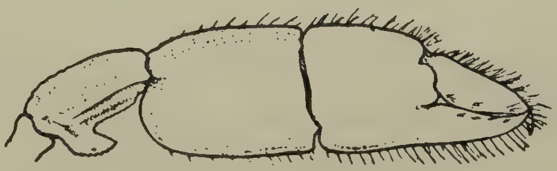
FAO Names : En - Flower ghost shrimp.



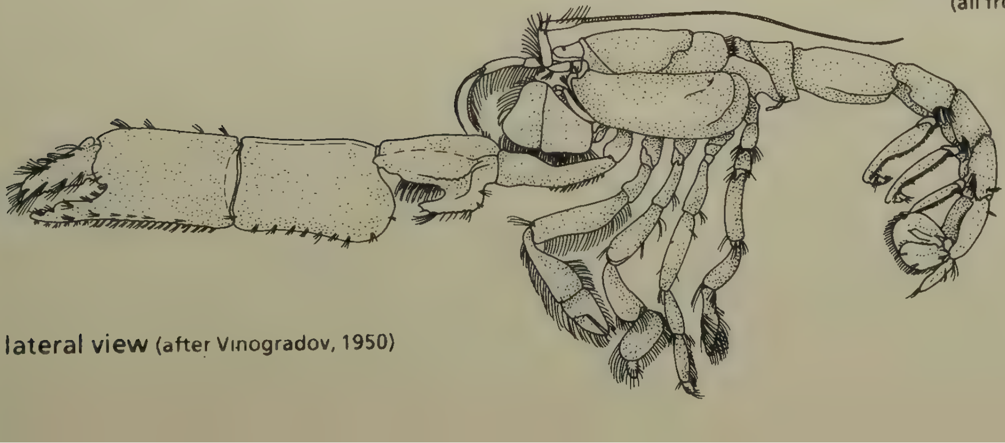
large cheliped of male



anterior part of body (dorsal view)



large cheliped of female (all from Liu, 1955)



lateral view (after Vinogradov, 1950)

Fig. 453

Type : Type locality of *C. petalura*: "In portu "Simoda" Japoniae" (=Shimoda, Izu peninsula, Shizuoka prefecture, Honshu, Japan). Type material probably lost in the 1871 Chicago fire.

Type locality of *C. gigas japonica* and *C. g. eoa* (the latter being a replacement name for the preoccupied former): "Japanisches Meer, Meerbusen Peter der Grosse, Bucht Patrokl" (= Patrokol Bight (Bukhta Patrokl) in Peter the Great Bay (Zaliv Petra Velikogo)), S.E. Siberian coast of Sea of Japan. Holotype male in Hydrology Institute, Leningrad, USSR.

Diagnostic Features: Rostrum very inconspicuous, a wide angle in the anterior margin of the carapace, overreached by the full length of the eyes. The eyes bluntly triangular or quadrangular. Antennal angle likewise inconspicuously triangular, without antennal spine. Antennular peduncle distinctly longer than the antennal peduncle, reaching beyond it with more than half the last segment. Third maxilliped with the ischium and merus expanded to form a distinct operculum. Large chela of adult male with a small concavity in the anterior margin of the palm above the fixed finger. Carpus somewhat longer than the palm and longer than high. Merus with a distinct process in the basal half of the lower margin; this process produced forward, ending in a narrowing rounded top. In the females this process is reduced to a small triangular tooth. Telson quadrangular slightly shorter than the uropods. The endopod of the uropod broadly triangular with rounded corners.

Geographical Distribution : S.E. Siberia, N. China, Japan (Fig. 454).

Habitat and Biology : On sand or mud flats of coasts that are more exposed than those where *C. japonica* is found. The species makes its burrows in the soft substrate.

Size : The total body length is 1.5 to 5 cm (males), 1 to 5 cm (females), 2.8 to 5 cm (ovigerous females).

Interest to Fisheries : The only reference known to me, concerning this aspect of the species, is its inclusion in Liu's (1955:65, pl. 23 fig. 6-9) "Economic shrimps and prawns of North China". It is most likely used as fish bait.

Local Names : JAPAN: Suna-moguri.

Literature : Sakai, 1969:233.

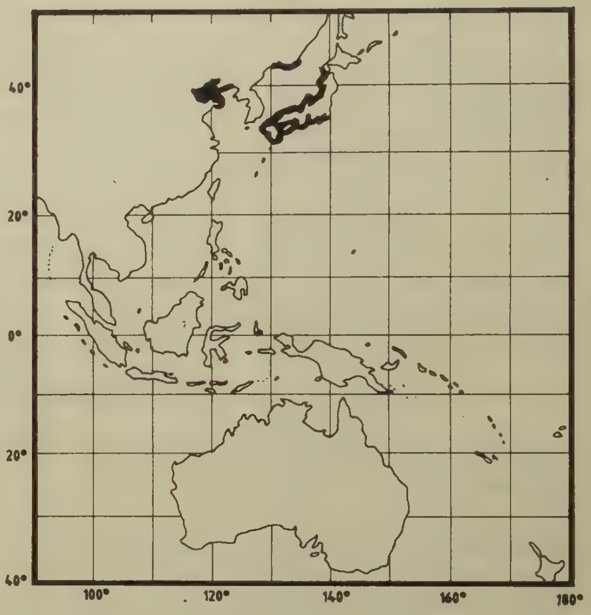


Fig. 454

Callianassa turnerana White, 1861

Fig. 455

CALL Call 8

Callianassa turnerana White, 1861, Proceedings Zoological Society London, 1861:42, pl. 6.

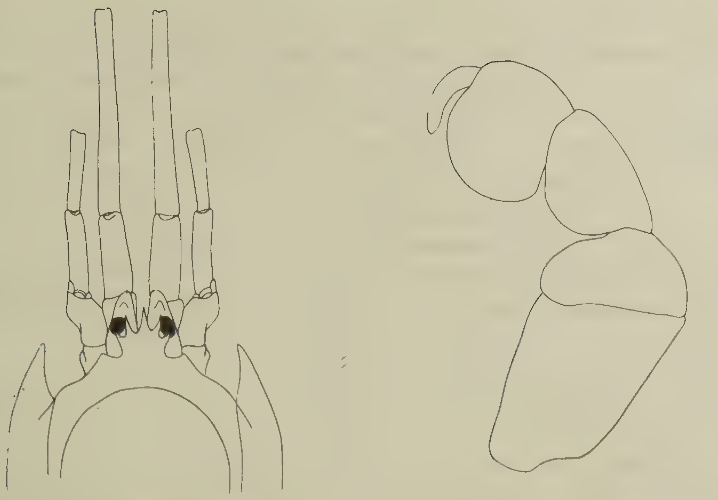
Synonyms: ***Callianassa krukenbergi*** Neumann, 1878; ***Callianassa diademata*** Ortmann, 1891; ***Callianassa (Callichirus) turnerana*** - Borradaile, 1903; ***Callianassa (Callichirus) krukenbergi*** - Borradaile, 1903; ***Callianassa (Callichirus) diademata*** - Borradaile, 1903.

FAO Names : En - Cameroon ghost shrimp.

Type : Type locality of *C. turnerana*: "Africa occ. (Cameroons)"; holotype in BM, no 58.36, in alcohol, condition fair.

Type locality of *C. krukenbergi*: "Central-Amerika" (this evidently is an incorrect statement of the type locality, as the species, before or since, has never been found outside West Africa); type material in SMF(not located in 1989), where it should be on permanent loan from the Zoological Museum Heidelberg University, Germany.

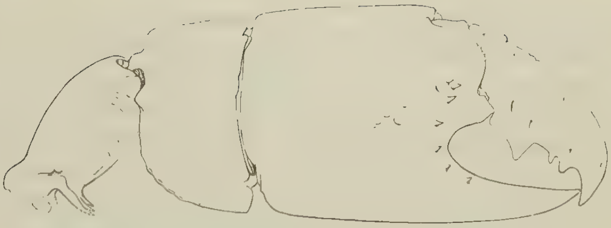
Type locality of *C. diademata*: "Afrika. Vielleicht aus Westafrika"; holotype male in MZS, preserved in alcohol, condition fair.



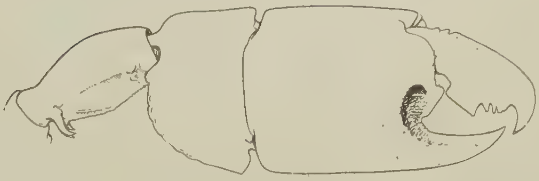
anterior part of body (dorsal view)

third maxilliped

(from Le Loeuff & Intes, 1974)

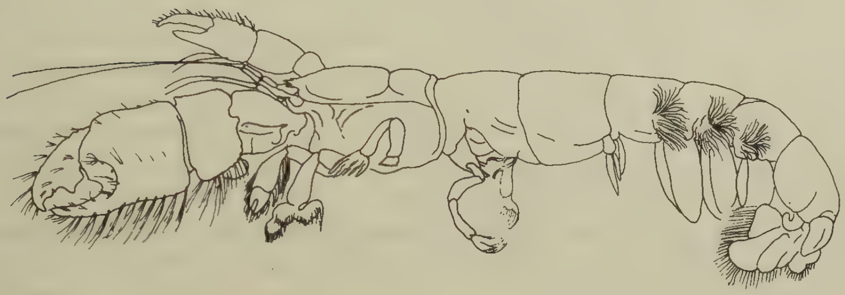


large cheliped of male

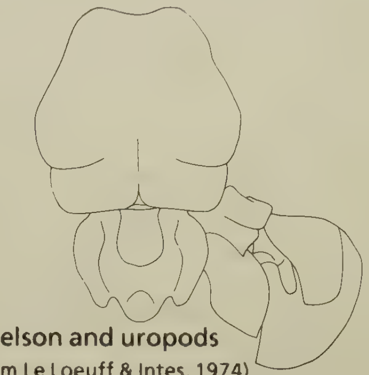


large cheliped of female

(from De Saint Laurent & Le Loeuff, 1979)



lateral view (after Vanhöffen, 1911)



telson and uropods

(from Le Loeuff & Intes, 1974)

Fig. 455

Diagnostic Features: Rostrum very distinct and reaching beyond the cornea of the eyes; in adult specimens the rostrum ends in three or five large teeth of equal size. In juveniles the rostrum is a simple elongate narrowly triangular tooth which reaches beyond the middle of the eyes. The antennal angles are bluntly rounded and unarmed. The antennular peduncle reaches with about half of the third segment beyond the antennal peduncle. The third maxilliped has the merus and ischium widely expanded to form an operculum. Also the carpus (which is only slightly longer than wide) and especially the propodus (which is much wider than long) are distinctly widened. The dactylus is very slender. The large first pereiopod of the female shows on the outer surface of the palm near the base of the fixed finger, a deep crescent-shaped depression with tubercles and spinules; this depression is not present in the males, where the anterior margin of the palm shows a rather wide not too deep concavity. In both sexes the carpus of the larger leg is shorter than the palm. The merus has a short process in the basal part of the lower margin, which ends in a few small sharp teeth. The telson is slightly broader than long and is distinctly shorter than the elongate, roughly diamond-shaped endopod of the uropod. The lateral margins of the telson are convex. In adult specimens the posterior margin of the telson consists of three bluntly rounded lobes; in the young the posterior margin of the telson is about straight but for a median concavity. No spines are found on the telson.

Geographical Distribution: West Africa from the Ivory Coast to Congo (Fig. 456).

Habitat and Biology: Like most, if not all *Callianassa* species, *C. turnerana* lives in burrows in the mud. It is found in estuarine areas, sometimes in practically fresh water. Every few (3 to 5) years the species swarms in enormous numbers in the slightly brackish or almost fresh waters of the estuaries.

Size: Total body length 5.5 to 14.5 cm.

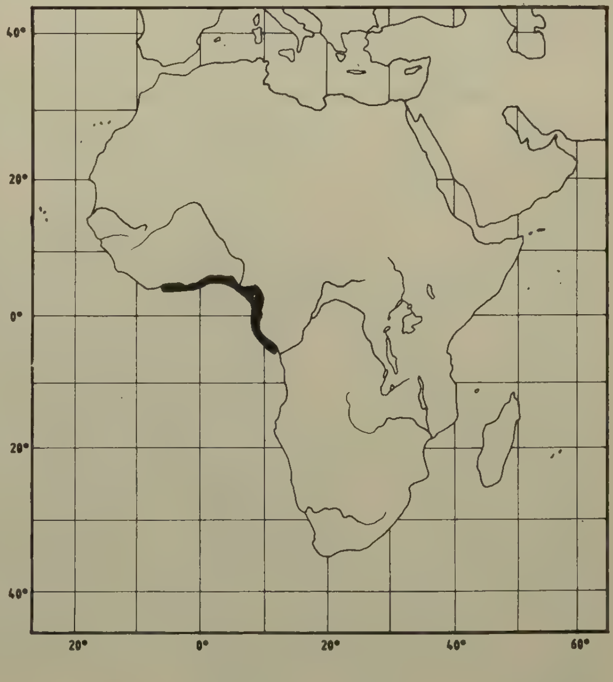


Fig. 456

Interest to Fisheries : The swarming of *C. turnerana* is the sign for the native population for large scale fishing activities. With baskets and with their bare hands the people from Cameroon catch enormous quantities while wading out into the river. Monod (1927:595-601; 1928:117-121) gave a vivid account of the fishery for these Callianassids in the Cameroon River near Douala. The female shrimps are eaten whole; the males are said to contain a substance that irritates the throat. The male abdomina are pressed and produce a kind of oil. The females are eaten and are highly esteemed as food. Part of the catch is eaten fresh, part is dried for later use in sauces and soups. A little known account of the fishery is given by Mary H. Kingsley (1897:402): "This swarming of the crayfish occurs about every five years, and for days the river-water is crowded with them, so that you can bale them out by basketfuls. This the native does, accompanying his operations with songs and tom-toms, and he then eats any quantity of them; another quantity he smokes and preserves, in what he pleases to regard as a dried state, for sauce making; and the greatest quantity of all he chucks in heaps to fester round his dwellings".

Local Names : CAMEROON: Mbéatoé, Mbotoré.

Literature : De Saint Laurent & Le Loeuff, 1979:64, figs 14c, 19e, 20a-d, 23 a-e.

Remarks: This species is probably the only crustacean (and certainly the only Thalassinid) for which a country is named. As reported by Vanhöffen (1911) and Monod (1927, 1928), when the Portuguese in the 15th century discovered the Cameroon River, they arrived at a time that *C. turnerana* was swarming; greatly impressed by this phenomenon they named the river Rio dos Camarãos (shrimp river) and a nearby cape Cabo dos Camarãos. The English transliterated this to Cameroons River, and the name Cameroons was used for the country and also adopted in other languages (Cameroun in French, Kamerun in German, Kameroen in Dutch, etc.).

Callianassa tyrrhena (Petagna, 1792)

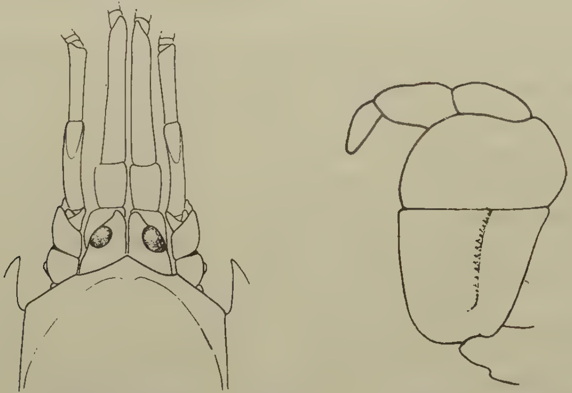
Fig. 457

CALL Call 9

Astacus tyrrhenus Petagna, 1792, Institutiones Entomologicae, 1:418, pl. 5 fig. 3.

Synonyms: ***Callianassa laticauda*** Otto, 1828; ***Callianassa (Callichirus) stebbingi*** Borradaile, 1903; ***Callianassa (Callichirus) laticauda*** - Borradaile, 1903.

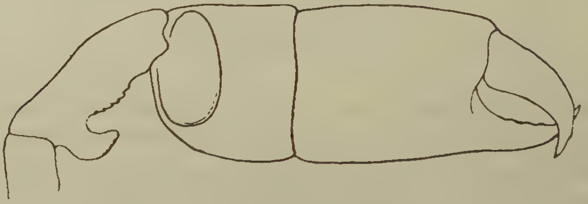
FAO Names : En - Sand ghost shrimp.



anterior part of body (dorsal view)

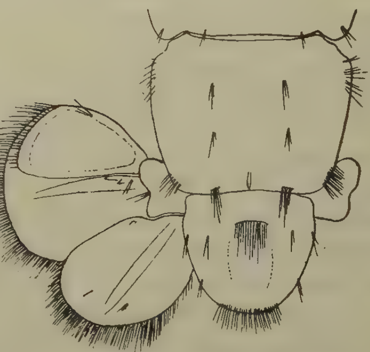
third maxilliped

(from De Saint Laurent & Bozic, 1976)



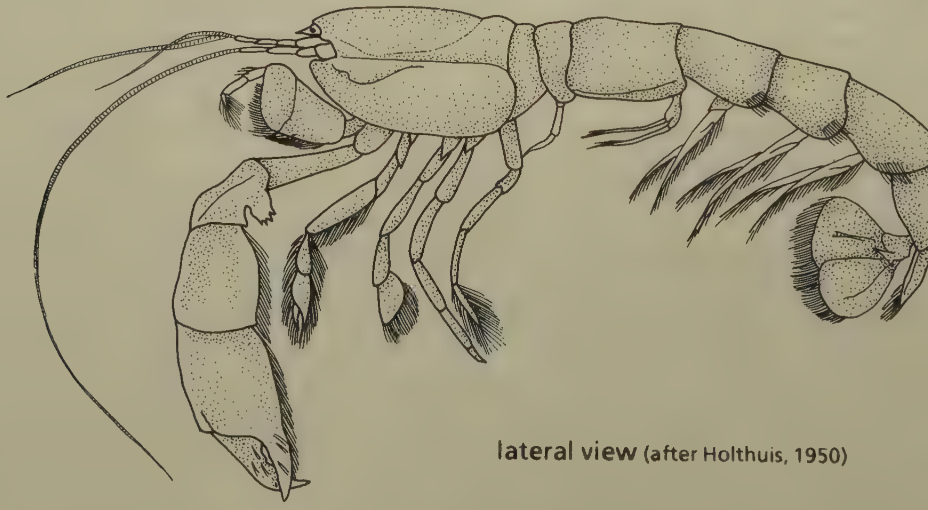
large cheliped

(from Bouvier, 1940)



telson and uropods

(from De Man, 1928)



lateral view (after Holthuis, 1950)

Fig. 457

Type : Type locality of *C. tyrrhena*: "In nostri maris arena habitat", i.e. the sea near Naples, Italy, where Petagna was a teacher. Whereabouts of type material unknown.

Type locality of *Callianassa laticauda*: "Ich fand diesen Krebs in ziemlicher Anzahl zu Nizza" (= Nice, dépt. Alpes Maritimes, S. France). Depository of syntypes unknown.

Type locality of *C. stebbingi*: Jersey, Channel Islands, UK. Two syntypes in BM, no. 84.18, in alcohol, condition fair.

Diagnostic Features: Rostrum short and broadly triangular with tip blunt. Eyes bluntly triangular, reaching beyond rostrum with practically their full length. Antennal angles also bluntly angular, without spine. Antennular peduncle slightly longer than antennal peduncle. Third maxilliped with merus and ischium expanded to form an operculum; last three segments not widened, much narrower and slenderer than operculum. Large chela without deep concavity in anterior margin of palm. Carpus as long as or slightly shorter than palm, and about as long as high. Merus with a rounded lobe in the basal part of lower margin; this lobe crenulate and not ending in a sharp point. Telson about as long as wide. Lateral margins convex, forming a regular curve with posterior margin. No spines present on telson. Endopod of uropod broadly oval or quadrangular with rounded corners, slightly longer than telson. **Colour** pale pink.

Geographical Distribution : Eastern Atlantic region from the North Sea and the Kattegat to Mauritania (N.W. Africa), also in the entire Mediterranean (Fig. 458). Previous records from the Black Sea may pertain to *C. candida* (Olivi, 1792) a species also known as *C. pontica* Czerniavsky, 1884 or *C. pestae* De Man, 1928.

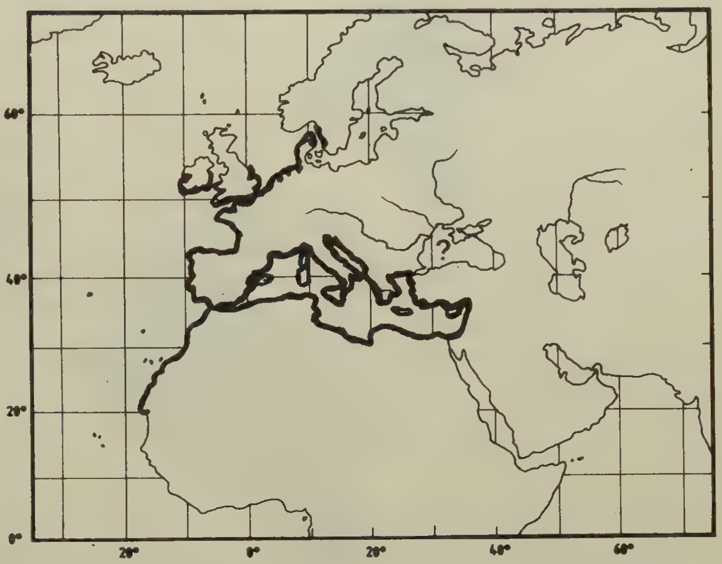


Fig. 458

Habitat and Biology : The species is found from the mesolittoral zone to a depth of a few meters (there are records of depths of 70 m). It burrows in the sand or muddy sand. The burrows may be 40 cm deep or more and have several exits. Water with low salinity is avoided

Size : Total body length up to 7 cm.

Interest to Fisheries : Already Petagna (1792:418) in the original description remarked : "piscium esca praestantissima". Cottiglia (1983:85) also observed that the species and especially the large specimens are used as bait by sport fishermen, although it does not show the same resistance to the fish hook as does ***Upogebia pusilla.***

Local Names : GERMANY: Maulwurfkrebs, Sandkrebs; ITALY: Corbola selvatica falsa, Scardobola; Corbola salvadega (Veneto); SPAIN: Topo de mar; Talp de mar (Cataluña).

Literature : Cottiglia, 1983:80-85, fig. 27a, 30, 31.

3. LIST OF SPECIES BY MAJOR MARINE FISHING AREAS

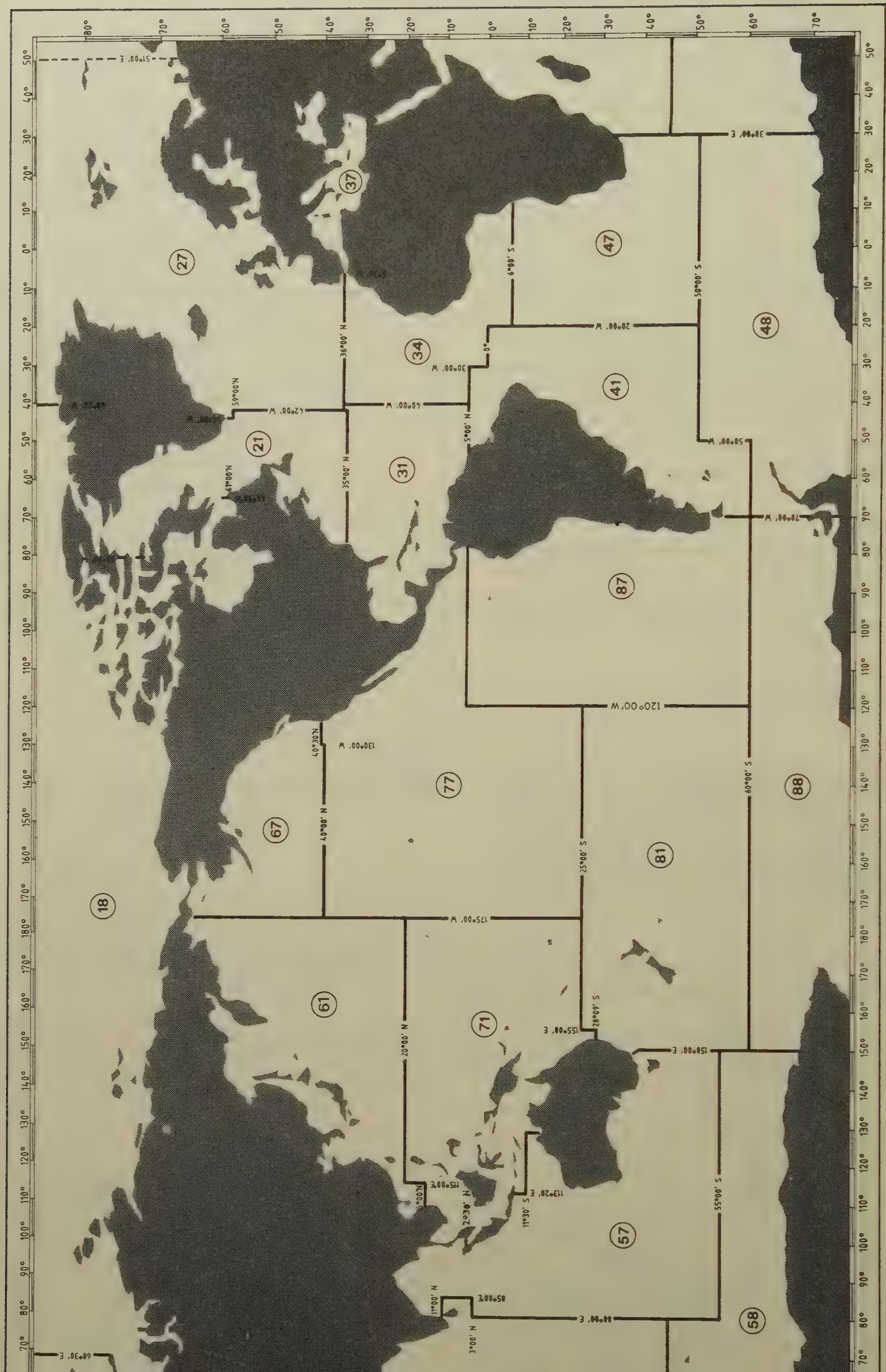

18
21
27
31
34
37
41
47
48
51
57
58
61
67
71
77
81
87
88
36°00' N
35°00' N
40°00' N
40°30'N
59°00'N
5°00' N
20°00' N
6°00' S
50°00' S
60°00' S
25°00' S
28°09' S
55°00' S
45°00' S
11°30' S
2°30' N
11°00' N
3°00' N
42°00' W
40°00' W
30°00' W
20°00' W
50°00' W
70°00' W
120°00'W
130°00' W
175°00' W
30°00' E
150°00' E
155°00' E
113°20' E
115°00' E
85°00' E
80°00' E

Fig. 459 Major fishing areas for statistical purposes

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																		
		MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																		
		18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
THAUMASTOCHELIDAE																				
Thaumastocheles japonicus	23													●						
Thaumastocheles zaleucus	24				●															
Thaumastochelopsis wardi	25															●				
NEPHROPIDAE																				
Acanthacaris caeca	26				●															
Acanthacaris tenuimana	28										●			●		●				
Nephropides caribaeus	31				●															
Nephropsis acanthura	35										●					●				
Nephropsis aculeata	36		●		●															
Nephropsis agassizii	37				●			●												
Nephropsis atlantica	38			●		●			●											
Nephropsis carpenteri	39										●	●		●						
Nephropsis ensirostris	41										●	●				●				
Nephropsis malhaensis	42										●									
Nephropsis neglecta	42				●															

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																		
		MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																		
		18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
Nephropsis occidentalis	43																●		●	
Nephropsis rosea	44				●															
Nephropsis stewarti	45										●	●		●		●				
Nephropsis suhmi	46										●					●				
Nephropsis sulcata	47										●					●				
Thymops birsteini	48							●		●									●	
Thymopsis nilenta	49									●										
Eunephrops bairdii	54				●															
Eunephrops cadenasi	55				●															
Eunephrops manningi	55				●															
Homarus americanus	58		●																	
Homarus capensis	59								●											
Homarus gammarus	60			●		●	●													
Metanephrops andamanicus	66										●	●				●				
Metanephrops arafurensis	67															●				
Metanephrops armatus	67													●						

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																		
		MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																		
		18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
Metanephrops australiensis	68											●								
Metanephrops binghami	70				●															
Metanephrops boschmai	71											●								
Metanephrops challengeri	72																	●		
Metanephrops formosanus	73													●						
Metanephrops japonicus	74													●						
Metanephrops mozambicus	75										●									
Metanephrops neptunus	76											●		●						
Metanephrops rubellus	77							●												
Metanephrops sagamiensis	78													●						
Metanephrops sibogae	79															●				
Metanephrops sinensis	80													●						
Metanephrops thomsoni	81													●		●				
Metanephrops velutinus	82											●				●				
Nephrops norvegicus	83			●		●	●													
Thymopides grobovi	85												●							

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																		
		MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																		
		18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
GLYPHEIDAE																				
Neoglyphaea inopinata	89															●				
PALINURIDAE																				
Jasus (Jasus) edwardsii	97																	●		
Jasus (Jasus) frontalis	98																		●	
Jasus (Jasus) lalandii	99								●											
Jasus (Jasus) novaehollandiae	100											●						●		
Jasus (Jasus) paulensis	101										●									
Jasus (Jasus) tristani	103								●											
Jasus (Sagmariasus) verreauxi	105											●				●		●		
Justitia japonica	108										●			●						
Justitia longimanus	109				●			●												
Justitia mauritiana	110										●						●			
Linuparus somniosus	112										●									
Linuparus sordidus	113											●		●						
Linuparus trigonus	114											●		●		●		●		

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																		
		MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																		
		18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
Palinurus charlestoni	116					●														
Palinurus delagoae	117										●									
Palinurus elephas	119			●		●	●													
Palinurus gilchristi	120								●		●									
Palinurus mauritanicus	121			●		●	●													
Palinustus mossambicus	124										●									
Palinustus truncatus	125				●			●												
Palinustus unicornutus	126										●									
Palinustus waguensis	126										●	●		●		●				
Panulirus argus	133				●			●												
Panulirus cygnus	134											●								
Panulirus echinatus	136					●		●	●											
Panulirus gracilis	137																●		●	
Panulirus guttatus	138				●															
Panulirus homarus	139										●	●		●		●	●			
Panulirus inflatus	141																●			

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																		
		MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																		
		18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
Panulirus interruptus	142																●			
Panulirus japonicus	143													●						
Panulirus laevicauda	144				●			●												
Panulirus longipes	145										●	●		●		●	●	●		
Panulirus marginatus	147																●			
Panulirus ornatus	148						●				●	●		●		●		●		
Panulirus pascuensis	149																●		●	
Panulirus penicillatus	151										●	●		●		●	●		●	
Panulirus polyphagus	152										●	●				●				
Panulirus regius	153					●	●		●											
Panulirus stimpsoni	155													●		●				
Panulirus versicolor	156										●	●		●		●	●			
Projasus bahamondei	158																		●	
Projasus parkeri	159								●		●							●		
Puerulus angulatus	162										●	●		●		●				

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																		
		MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																		
		18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
Puerulus carinatus	163										●									
Puerulus sewelli	164										●									
Puerulus velutinus	165															●				
SYNAXIDAE																				
Palibythus magnificus	167																●			
Palinurellus gundlachi	168				●			●												
Palinurellus wieneckii	170										●	●		●		●	●			
SCYLLARIDAE																				
Arctides antipodarum	175																	●		
Arctides guineensis	176				●															
Arctides regalis	177										●					●	●		●	
Scyllarides aequinoctialis	183				●			●												
Scyllarides astori	184																●		●	
Scyllarides brasiliensis	185							●												
Scyllarides deceptor	186							●												
Scyllarides delfosi	187				●			●												

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																		
		MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																		
		18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
Scyllarides elisabethae	188								●		●									
Scyllarides haani	189										●	●		●		●	●	●		
Scyllarides herklotsii	190					●			●											
Scyllarides latus	191			●		●	●													
Scyllarides nodifer	192				●															
Scyllarides roggeveeni	193																		●	
Scyllarides squammosus	194										●	●		●		●	●	●		
Scyllarides tridacnophaga	195										●	●								
Evibacus princeps	196																●		●	
Ibacus alticrenatus	200											●						●		
Ibacus brevipes	201															●				
Ibacus brucei	202															●		●		
Ibacus ciliatus	203											●		●		●				
Ibacus novemdentatus	204										●	●		●		●				
Ibacus peronii	205											●				●		●		

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																		
		MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																		
		18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
Parribacus antarcticus	209				●			●			●	●		●		●	●			
Parribacus caledonicus	211															●	●			
Parribacus holthuisi	212																●			
Parribacus japonicus	213													●						
Parribacus perlatus	214																		●	
Parribacus scarlatinus	215															●	●			
Scyllarus arctus	217			●		●	●													
Scyllarus batei	219										●	●		●		●				
Scyllarus bertholdii	221											●		●		●				
Scyllarus brevicornis	222													●						
Scyllarus martensii	223										●	●		●		●				
Scyllarus pygmaeus	224					●	●													
Scyllarus rugosus	225										●	●		●		●				
Thenus orientalis	227										●	●		●		●				
THALASSINIDAE																				
Thalassina anomala	229										●	●		●		●	●			

SPECIES	PAGE	GEOGRAPHICAL DISTRIBUTION																		
		MAJOR MARINE FISHING AREAS FOR STATISTICAL PURPOSES																		
		18	21	27	31	34	37	41	47	48	51	57	58	61	67	71	77	81	87	88
UBOGEBIIDAE																				
Upogebia capensis	233								●		●									
Upogebia major	234													●						
Upogebia pugettensis	235														●		●			
Upogebia pusilla	236			●		●	●													
Upogebia wuhsienweni	238													●						
CALLIANASSIDAE																				
Callianassa australiensis	241											●				●		●		
Callianassa biffari	242																●			
Callianassa californiensis	244														●		●			
Callianassa gigas	245														●		●			
Callianassa japonica	246													●						
Callianassa kraussi	248								●		●									
Callianassa petalura	249													●						
Callianassa turnerana	251					●														
Callianassa tyrrhena	252			●		●	●													

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